

# the IRON AGE

A CHILTON

PUBLICATION

UNIV. OF MICHIGAN

JAN 19 1953

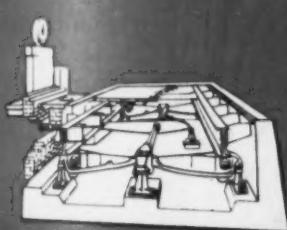
NATIONAL METALWORKING WEEKLY

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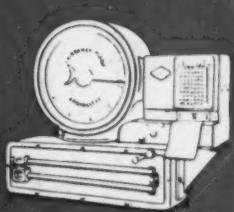
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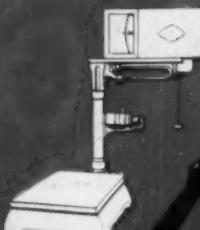
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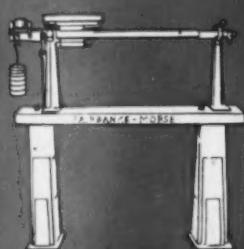
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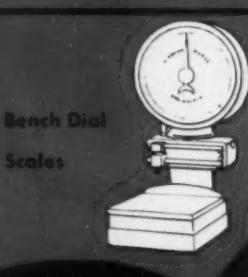
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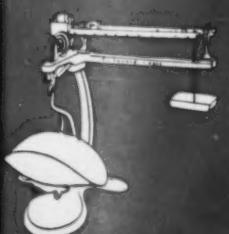
Type Registering Beam Scales



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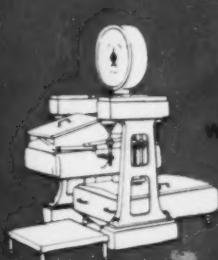
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**Speeds  
your weigh!**

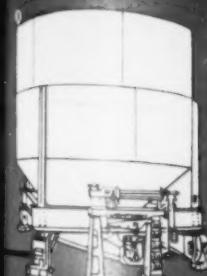
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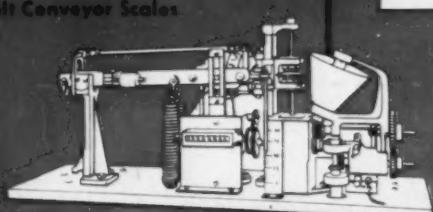


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Read this **important** report!

#### CONTROL THE BLAST AND IMPROVE OPERATION

A new Whiting 8-page report, "Cupola Blast Control," describes the latest methods for maintaining quality and economy in cupola melting. It contains all the important data for air blast control and humidity compensation which were prepared after considerable research by the Battelle Memorial Institute, including charts for rapidly determining the relationship between humidity, blast rate and coke weight.

The report also contains illustrations of equipment being used to control the volume of air by weight and the moisture content automatically.

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"The Electric Furnace In The Iron Foundry", FO-6

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WHITING CORPORATION  
IRON & STEEL EQUIPMENT



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Editorial, Advertising and Circulation  
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Circulation Representatives: Thomas  
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January 15, 1953

**Editorial**

*The Iron Age*

FOUNDED 1855

## As Good Now As Ever

THE Mellon banking interests in Pittsburgh have contributed greatly to that city's and to our country's growth. They grew with America. They grew too by the use of up-to-date methods in business, business machines and credit techniques. But they and hundreds like them got where they are for a few other reasons not always talked about.

Much of the present size and quality of the Mellon companies was due to imagination, trust in mankind, proper recognition of integrity and a realization that to gain we must sometimes lose.

In the old days the late Andrew Mellon's father made many a loan to small business, to men who had nothing for collateral except their word, to men who had vision but needed help. Many of those businesses and those men went forward to rank tops in our industrial world.

Another important characteristic played its part in the Mellons' success. Their banks always treated the young fellow of 18 (who often had a bank balance of less than \$2.00) with the same courtesy and interest as they did the fellow at the next window who was depositing hundreds or thousands of dollars.

They felt this way: Let's give every young depositor the best attention we can; some day this young fellow may be the older fellow who has succeeded and needs banking help. It paid off.

We could use more of this old fashioned thinking today. We have become so used to IBM machines—which do such a wonderful statistical job—that we often forget the human element. There is one. Too, there are thousands of young businesses and young fellows today who will be big customers tomorrow. They possess as much integrity, imagination and strength as their predecessors despite sensational headlines in the papers. Some of these people called "small business" may not be getting the treatment they deserve.

Larger businesses should realize that without small business they would exist for only a short time. Business in general can, with good results, take a closer look at its standards in accepting and servicing customers, in collecting accounts and in taking chances that can win as well as lose.

Human beings will always play the major part in business no matter how far our electronic machines progress. You may be losing a future mainstay of your business if you don't give more than lip service to small business.

*Tom Campbell*

*Editor*

# Cost of Handling Steel Bars Cut in Half

*with* **BAKER TRUCK**

JONES & LAUGHLIN  
DETROIT WAREHOUSE  
USES CRANE TRUCKS  
AND PORTABLE RACKS  
FOR MORE EFFICIENT  
HANDLING AND STORAGE

★ Specially designed portable sectional racks for storing steel bar and rod stock plus the use of a BAKER Crane Truck have cut handling costs by one-half at the Jones & Laughlin Steel Corporation's Detroit Warehouse. This stock was formerly stored by hand in upright position, requiring laborious manual handling. Even with overhead cranes, considerable hand labor was necessary. Previous to the purchase of the truck and the installation of the portable racks, Jones & Laughlin used 6, 8, or more men to pile steel and fill orders. The entire operation is now handled by three men. With the Baker Crane Truck and sectional storage racks, costs have been halved—



and the crane truck still has time to handle steel packs—a further saving not anticipated when it was purchased.

Illustration shows the BAKER Crane Truck handling steel bars stored on sectional racks set at 45° angles in 15 x 15 foot bays.

*Documented Case History of Baker Truck savings for Jones and Laughlin is available. Use coupon below.*

The Baker-Raulang Company  
1227 West 80th Street, Cleveland 2, Ohio

Please send me case study report No. 3051 showing savings with Baker Truck at Jones & Laughlin.

Name ..... Title .....

Company .....

City ..... State .....

**Baker**  
**INDUSTRIAL TRUCKS**

# Dear Editor:

## Letters from readers

### Getting Ahead

Sir:  
We are writing for permission to use the editorial "How To Get Ahead" published in the Dec. 18 issue.

We would like to use the article, or part of it, in our February issue of the *Linklet* — our company house magazine.

M. S. HAUN  
Editor, "Linklet"

*Link-Belt Co.,  
Philadelphia*

### Industrial Diamonds

Sir:  
Referring to your Dec. 18 issue, p. 73, regarding synthetic industrial diamonds, we would appreciate any further information you can give us.

R. D. PROSSER  
*Thomas Prosser & Son  
New York*

More information may be obtained from W. G. Cass, Wykeham Rise, Chinnor, Oxon, England.—Ed.

### Popular Issue

Sir:  
MAY WE USE WITH CREDIT THE FOLLOWING FROM DEC. 18 ISSUE: EDITORIAL AND CARTOONS, PARTICULARLY P. 85.

J. REESE  
Editor, "News and Views"  
*National Pressure Cook Co.  
Eau Claire, Wis.*

### Oxychloride Cement

Sir:  
I refer to an article under Technical Briefs in the Dec. 18 issue entitled "Oxychloride Cement." This somehow strikes a chord in my early experience as a construction engineer.

I shall be glad to get further information on the oxychloride floor.

I thoroughly agree with the association in their demands for standardization in concrete floors in industrial plants.

G. R. HOUSTON  
*King City, Mo.*

Further information on oxychloride cement flooring may be obtained from J. B. James, Oxychloride Cement Assn., 1028 Connecticut Ave., Washington 6, D. C. The American Standards Inc., 70 E. 45th St., New York 17, N. Y., is also preparing standards on oxychloride cements.—Ed.

### Faster, Better Heats

Sir:  
Your Dec. 4 issue contains an article in which I am extremely interested.

I would appreciate it very much if it were possible for you to send me four copies of the article "Stainless Steel Melting Practices Have Changed."

G. C. OLSON  
Melting Superintendent  
*Atlas Steels Ltd.  
Welland, Ont.*

### Shell Mold Patterns

Sir:  
Inasmuch as we are extremely interested in the article on shell molding appearing on p. 172 of your Dec. 11 issue, we are requesting about a dozen tear sheets of this article.

P. J. BERNIER  
Partner  
*Wolverine Pattern & Mfg. Co.  
Saginaw, Mich.*

### Industry Needed

Sir:  
Please send me five tear sheets of the article entitled "Industry: A Town Is Dying Without It" which appeared on p. 17 of your Dec. 25 issue.

A. J. KOOREY  
Research Associate  
*The Pennsylvania State College  
State College, Pa.*

### No Excuse

Sir:  
I always scan your annual review numbers with avid interest. Imagine my surprise and pleasure at finding one of our drawings reproduced on p. 302 of your 1953 book—the tube extrusion art work and the accompanying captions.

I am well aware of the pressure under which you boys got out your annual and I know that, under such circumstances, it is not easy to remember to give credit in every instance where credit is due. However, I must confess that our staff looked for a credit line for *U. S. Steel News* and was disappointed to find none.

G. L. LACHER  
Editor, "U. S. Steel News"  
*U. S. Steel Corp.  
Pittsburgh*

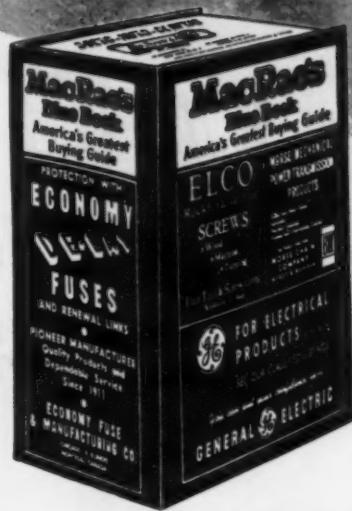
The pressure part is correct but is no excuse for our failure to credit *U. S. Steel News*.—Ed.

### Precoating Pays Off

Sir:  
We would very much appreciate your sending us several sets of tear sheets on your article appearing in the Dec. 18 issue titled "Production Costs Lowered With Precoated Coil Stock."

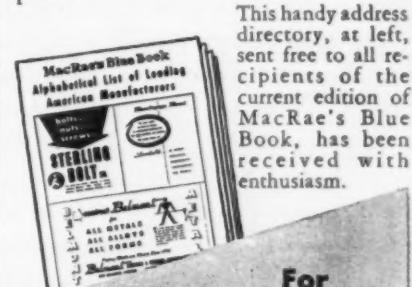
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*Globe Venetian Blind Corp.  
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Records of the operation of a fleet of electric industrial trucks in an eastern plant of a large manufacturer of domestic heating equipment show that all cells of all EDISON storage batteries replaced during the past five years gave an average service life of 13.75 years.

The EDISON batteries have never failed to furnish ample power for continuous, full-shift truck operation. And the trucks are hard workers. They regularly handle loads of sheet steel and fabricated metal parts averaging close to their full rated capacities. On occasion, the batteries have operated the trucks for 10 hours without being exchanged—an indication of their ample reserve

of operating power *through the very end* of the shift.

Such outstanding performance is not unusual. It's the kind of performance that may be expected from EDISON batteries anywhere under similar conditions of application, operation and maintenance. Get the facts about what they can do on *your job*. It will pay you to send for Bulletins S. B. 3808 and S. B. 2039 and the address of your nearest Edison field engineer.

**Most Dependable Power . . . Lowest Over-all Cost  
... you get both with an EDISON**



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Nickel • Iron • Alkaline  
STORAGE BATTERIES

Edison Storage Battery Division of  
Thomas A. Edison Incorporated, West Orange, N.J.

# Fatigue Cracks

by William M. Coffey

## Well Done

In getting the news first, fast and right your *ffj's* editors are regularly rewarded by various industry and publishing associations with numerous awards, plaques and citations. In the 98-year history of *THE IRON AGE*, however, there has been none to which we point with more pride than an award just received by John Delaney, our famous Pittsburgh editor. The award came from the Pittsburgh office of the *Wall Street Journal* and it is inscribed as follows:

"The Eddie Beachler and  
Dow-Jones Meritorious  
Service Award  
**JOHN DELANEY**  
Father of the Year—1952"

Eddie Beachler, a writer for the *Pittsburgh Press*, is the father of eight children. John's award came about because his fifth child, a boy, was born November 6. That makes three boys and two girls. The "award" consists of teletype ticker tape shaped in the form of a rosette with the inscription, typewritten on a round piece of paper, in the center. This is draped around the neck. We are mighty proud of this, John, and as this is an annual award, Editor-in-chief Tom Campbell says we should make every effort to win it each year.

## Woman's Page

It is now a misdemeanor to buy land from an Indian.

\* \* \*

By 1954 the Air Force will have a forging press in operation capable of exerting a squeezing force of 50,000 tons.

\* \* \*

A small boy returned a dirty, dog-eared copy of "Advanced Calculus." The librarian automatically discharged it, then noticed the title. She asked the boy, "Rather technical, isn't it?" The young lad placed his hands on his hips defiantly. "Yeah, but it was that way when I got it."

\* \* \*

Seems in a certain town housewives are in a stew because of the discovery that servant girls (what's that?), upon termination of their employment, have been writing candid opinions of their employers, the housewives, beneath the sink—where the new girl would find it. While you're

under there, why not fix that leaky faucet?

\* \* \*

The Dover, Del., regular P. T. A. meeting has been shifted from 0800 to 0915.

## OÙ EST? — Lafayette

Where do the million-dollar ideas come from? Last week we told you about Hiram Hanmore, who discovered a magnesia-asbestos insulation because of his bad stomach. This week, we've the story of two young fellows who are currently eliminating industrial air pollution by electrostatic air filters under the banner of the Trion Company, McKees Rock, Pa. They listened when their high school physics teacher told them about Thales, one of the wise men of old Greece, who observed the attraction of an amber rod for dust particles after it had been stroked with silk. From there it was but 500 steps to hang an electrified wire in a bottle filled with smoke which caused the particles of smoke to collect on the sides of the jar—and the filter was born. Many factories, harassed by smoke legislation, are happy these boys stayed awake in class. End.

## Puzzlers

Some more license plate winners: F. M. Peterson, Convair, Ft. Worth, Texas; W. B. Ingalls, IBM, Endicott, N. Y.; G. F. Kiesel, Jr., St. Louis, Mo. Some more unpainted sphere winners: E. A. Schwab, Emerson Corp., N. Y. C.; and R. Boruta, Milwaukee, Wisc. Some more monument winners (answer: 3 ft and 2 ft cubes): W. L. Havekotte, Firth Sterling, Pittsburgh, Pa.; F. E. Adams, R. Laney and J. Sternisha of Thompson Products; J. Woldrich, Clark Equipment, Buchanan, Mich.; G. Mitoch, St. Louis, Mo.; J. Capdau, Gullet Gin Co., Amite, La.; H. J. Holmes, Atlas Press, Kalamazoo, Mich.; H. Morrison, Roots-Connersville, Delaware, Ohio; Mrs. Carl E. Heussner, Birmingham, Mich.

## New Puzzle:

A ship is twice as old as its boiler was when the ship was as old as the boiler is now. In 10 years the sum of their ages will be 62. What are their present ages?

## THREADED SPECIALTIES

# EYE BOLTS

by an  
exclusive method



Among Pawtucket's many specialty products, these lower-cost eye bolts or "swing" bolts are the leaders in this field. Pawtucket's exclusive production method keeps cost low, dimensional accuracy unusually high and strength above standard.

Pawtucket eye bolts are made in standard sizes  $\frac{1}{4}$ " and larger, or to your specifications. In any size, you can depend on a uniform Class 3 fit.

BETTER BOLTS SINCE 1882

# PAWTUCKET

"THE BOLT MAN"  
MANUFACTURING COMPANY

327 Pine Street — Pawtucket, R. I.  
THE PLACE TO SOLVE YOUR BOLT PROBLEMS

T.M. REG.



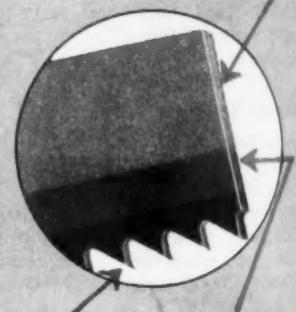
## IT'S SHATTERPROOF!

Double welding makes Starrett SAFE-FLEX Power Hacksaw Blades the safest, straightest cutting, long-lasting blade ever made. Use it with complete safety for your toughest cutting jobs — for multiple sawing work or interrupted cuts. Use it with greater economy for *all* your power cutting. Step up the speed and feed. Watch it cut clean and fast with no danger of shattering.

Double welded construction, an entirely new development in hacksaw design, gives Starrett SAFE-FLEX blades the perfect combination of hardness and toughness. The cutting edge of hard, high speed steel is reinforced with a medium hard, extra strong center and backed up with a super-tough steel back. See what the new Starrett SAFE-FLEX blade can mean to you in more and straighter cuts per blade. Order a supply today. Address Dept. IA.

Here's what  
**DOUBLE-WELDED  
SHATTERPROOF  
CONSTRUCTION MEANS**

Super Tough Steel Back  
For Extra Toughness.



Hard "High Speed"  
Edge For High Production — No Tooth Stripping.  
Medium-Hard Steel Center For Extra Strength.



**Starrett**  
TRADE MARK  
REG. U. S. PAT. OFF.

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WORLD'S GREATEST TOOLMAKERS



THE L. S. STARRETT COMPANY  
Athol, Massachusetts, U. S. A.

MECHANICS' HAND MEASURING TOOLS AND PRECISION INSTRUMENTS  
DIAL INDICATORS • STEEL TAPES • PRECISION GROUND FLAT STOCK  
HACKSAWS, BAND SAWS and BAND KNIVES

Buy  
THROUGH YOUR  
**INDUSTRIAL  
DISTRIBUTOR**

- Prompt delivery
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- Quality products

## THE IRON AGE Newsfront

GREATLY EXTENDED FATIGUE LIFE has shown up in rotating fatigue tests of vacuum melted 52100. Fatigue life for the vacuum melted metal has tested 50 pct better than standard electric furnace 52100.

SHORTAGE OF AIRCRAFT QUALITY WIRE HAS EASED due to aircraft cutback. Backlogs that were up to 6 or 9 months in the first quarter of this year are shrinking rapidly.

TARIFF DUTIES ON BAUXITE IMPORTS will get a thorough eyeing by Congress. Under reciprocal trade negotiations, the \$1 a ton levy has already been reduced to 50¢. A bill now before the House Ways and Means Committee would remove the tariff completely.

THE ALL-STEEL HOUSE will be a commercial reality in the not-too-distant future. Field tests have proven latest models to be both attractive and practical. As an outlet for sheet and strip steel the possibilities are tremendous.

HOTTEST SUBJECT IN AUTOMOTIVE CIRCLES today is reducing tooling costs and shortening the tooling time cycle. Plastics are spearheading this development but this is only one of several approaches toward reducing the high cost of tooling.

BERYLLIUM COPPER IS BEING SUCCESSFULLY WELDED for the first time with a condenser discharge type resistance welder. Previously these alloys could not be welded because welding temperature was far above the 700° F heat treating temperature. With the present welding method there is no excess heat and mechanical and electrical properties are not destroyed.

AT LEAST THREE NEW BLOOMING MILLS are on the books to start scheduled production in 1953. All three are located in the Midwest. One will probably be in production by March.

PLASTICS MAY BE INVADING the amphibious vehicle field. Plans are now being developed for an amphibious vehicle with a single cast plastic hull.

MORE SHIPS WILL BE BUILT IN 1953 than last year, according to the Ship-builders Council of America. At a recent meeting builders were told shipbuilding and repairing would remain stable for some time.

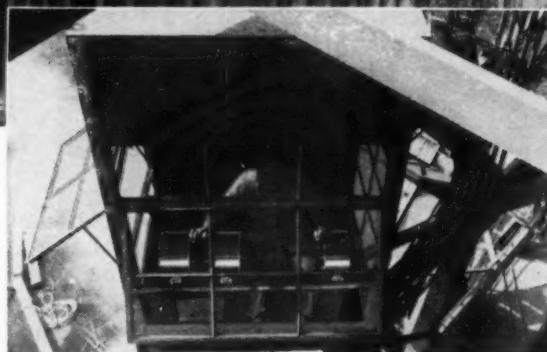
SUPPLY OF STAINLESS STEEL WELDING WIRE has already begun to fall off. It's one of the first effects of Ordnance's recently announced tank stretchout program.

MANUFACTURE OF RARE EARTH COMPOUNDS IN INDIA is expected to start soon. A new plant, set up by India's Atomic Energy Commission, will process 1500 tons of monazite sand annually. Expected by-products: 1000 tons of rare earth chlorides; 450 tons of rare earth carbonates; 1500 tons of tri-sodium phosphate; 205 tons of thorium nitrate; caustic soda lye.

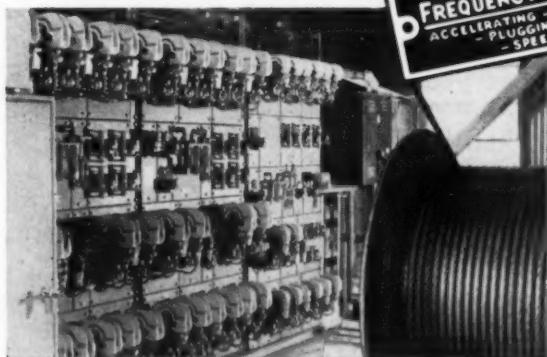
RECENT RAPID PROGRESS in perfecting push-button weapons has made several types of atomic rockets and guided missiles available in quantity for combat use. Army has streamlined today's atomic artillery shell down to 11 in. in diam. The World War II atomic bomb was several feet in diameter.



**Fast Lifts—Safe Lifts  
WITH EC&M  
CONTROL  
easy to operate, TOO**



Narrow-width EC&M Cam Master Switches are closely grouped for operator's convenience on this 720 ton-per-hour Barge Unloader, designed, fabricated and erected by Heyl & Patterson for the Duquesne Slag Company, Pittsburgh, Pa.



EC&M LINE-ARC Contactor Controllers for Closing & Holding Line Motors and for the Trolley Motion are EC&M Frequency Relay Controlled for fast, safe operation.

Output increases and costs go down when operators find rhythmic response at their finger-tips. Paying out cable to dig into the pile, taking the swing out of a loaded bucket at the point of discharge, and keeping the bucket open when lowering for another load are time-savers on bulk material-handling applications.

On river unloading stations, at lake and ocean ports, EC&M Control has a reputation among operating management for fast handling because bucket manipulation, trolley travel and similar operations respond quickly to the operator's needs. Straight-line, lever-operated EC&M Cam Master Switches have a short throw in both directions—are less tiring on the operator—the off-point is distinct and easy to find when returning from any of the speed-points. Put your control applications up to EC&M.

*It pays to specify EC&M Control—  
control engineered for high  
output with safety.*



**THE ELECTRIC CONTROLLER & MFG. CO.**  
2698 EAST 79TH STREET . CLEVELAND 4, OHIO

# MANGANESE: Brazil Our Biggest Source?

**There's an awful lot of manganese in Brazil . . . Has 60 to 70 million tons of ore . . . DMPA contracts for Amapa ore . . . Country studded with other rich deposits—By R. L. Hatschek.**

Brazil is on the verge of becoming the leading supplier of manganese to U. S. steelmakers. It's an important step—both economically and strategically—since the U. S. imports some 90 pct of its needs. As late as 1948, Russia was the leading supplier but now the main sources are in Africa and India. Supply routes to these countries are more distant and dangerous in war.

Last week's signing of a Defense Materials Procurement Agency contract involving 5.5 million tons of high-grade manganese ore over an 8½-year period signals the shift. An Export-Import Bank loan of \$67.5 million was granted at the same time for development of the rich deposits in Amapa Territory (THE IRON AGE, Aug. 17, 1950, p. 101 and Feb. 22, 1951, p. 89).

Industria e Comercio de Minérios, S. A., (Icomi) of Rio de Janeiro is doing the development work on the Amapa deposits 150 miles north of the equator. Some \$4 million has already been spent. Bethlehem Steel Corp. has a 49 pct interest in this project.

**Contract Terms**—At least 70 pct of the 5.5 million tons of ore is to be offered to the U. S. A total of 400,000 tons of ore is to be delivered for stockpiling and other defense needs in 1956 and 1957. The government has an option on 30 pct of the total production. DMPA guarantees a floor price of 65¢ per long ton unit (22.4 lb), based on 45 to 47 pct ore c.i.f. Eastern Seaboard ports for any part of the production up to 5.5 million tons that is offered to the U. S.

Principal of the loan is to be repaid by Dec. 31, 1965 and bears

an interest rate of 4.5 pct per year. DMPA's purchase contract runs to June 30, 1962 but would end upon repayment of the loan at an earlier date.

**Reserves**—Results of core drilling tests put the Amapa deposits at upwards of 10 million tons of high-grade ore containing 45 to 47 pct manganese with other estimates placing the total at 20 or 25 million tons. Open pit methods will be used and the ore is to be crushed and screened at a plant to be built near the mine.

Ore will travel by rail to the port of Santana, straddling the equator, over 134 miles of track which is yet to be laid. The manganese will then be transferred to ocean-going vessels by modern fa-

cilities capable of loading at a rate of 3500 tons an hr. Exports from these deposits are expected to start about the end of this year.

**Other Deposits**—But Brazil is a big country and Amapa is not the only area where manganese has been discovered. The State of Minas Gerais has deposits estimated to contain about 7 million tons, and beds of manganese ore have been found at Urucum in Mato Grosso.

The latter deposit, some 1450 miles south of the Amapa find, is terrific. It has been estimated to contain 4.2 million tons of measured ore beds with an average content of 46.5 pct, nearly 12 million tons of indicated ore and 17.5 million tons of inferior ore. This area is rich in iron ore as well.

Here U. S. Steel Corp. has its interests through a subsidiary, Companhia Meridional de Mineracao, headquartered in Rio de Janeiro. Like Bethlehem, U. S. Steel holds a 49 pct interest, with a Brazilian firm owning the remainder.

An Export-Import loan of \$30 million was granted in 1950 for the development of this ore source. It is to provide mining machinery, loading equipment, rail spurs to the river terminal, 12 towboats and 68 barges. Since the deposit is deep in the interior, as contrasted to the Amapa beds, ore must be floated down the Paraguay River through the country of Paraguay, down the Parana River through a portion of Argentina to a port on the Plata River. Here the ore will be transferred to ocean-going ore carriers for its journey to U. S. furnaces.

**Exports**—In 1951 Brazil exported 119,900 tons of manganese ore. Under the DMPA contract terms, it will export at least 200,000 tons a year in 1956 and 1957.



**ORE BODY:** Map shows location of 17 deposits discovered in Amapa. Macapa is seat of Territorial Government.

## Expansion

# ALUMINUM: 'Competition' Snags Growth

**Congress warming up to problem of agencies crimping expansion of aluminum by insistence on new competition . . . New capacity goes begging with no takers—By A. K. Rannells.**

Congress may be getting set to take a closer interest in activities of those government agencies which eye askance the "development of competition" in basic industries and don't see the more realistic factors at all. That some aluminum expansion is snagged on stubborn governmental insistence on creating new competition may be the fuse-lighting factor.

A clue to this warming Congressional interest is found in a report by the defense "watch dog" committee (Joint Committee on Defense Production), following a review of Defense Production Administration's aluminum program.

**No Takers**—Some 36,000 tons of projected new capacity under third round aluminum expansion still goes begging. Under present policies, there is no promise of takers for an additional 200,000 tons the DPA would like to recommend.

The committee doesn't hold itself competent to judge whether there is now too little competition within the aluminum industry. But it has no hesitancy in declaring:

"There does not now seem to be any need for defense agencies to place creation of new competition

ahead of all other considerations in determining the military aluminum program for the years immediately ahead."

The committee supports this position by pointing out that on completion of present planned capacity, Alcoa, the main target of the government for the past several years, will have only 38.1 pct of total capacity. The remainder is split up as follows:

Reynolds, 24.4 pct; Kaiser, 23.3 pct; Olin, 6.2 pct; Harvey, 3.1 pct; Anaconda, 2.8 pct; and still unassigned 2.1 pct.

**Measure Competition**—There is no competent yardstick with which to measure whether there is too little competition within such basic industries, it is pointed out, and no statistic nor group of statistics by themselves can show the state of competition.

One trouble is the sizable investment involved in such an enterprise. This is pointed up sharply by citing difficulties encountered by DPA in programming its three rounds of expansion.

During the first round, no new producer was able to take part. But with the second round, Anaconda came in. Then Olin and Harvey

joined the parade during the third round.

DPA has been trying desperately to interest more new companies. Last April and again in October, American industry sent up trial balloons in an attempt to find out to what extent it would take part in the proposed third round.

**Costs are Great**—Interest was shown by seven companies. This sifted down to only five which indicated an active interest. Harvey came in. The remaining four firms at present are thinking along this line: The probable future of aluminum prices would not warrant risking the sizable amounts of capital needed.

Trouble is that while processing and other production costs have increased, the base price of primary aluminum is no higher now than in 1939. Most other metal prices have at least doubled from the levels of that year.

Financial and technical problems facing any prospective new producer in a basic industry are of such proportions that only those who can afford to gamble with large capital investments can become bona fide producers, the committee finds.

A hands-off policy seems most appropriate for the government, leaving to members of industry the choice of whether they want to operate on an integrated or non-integrated basis, the report concludes.

## Special Report

*Continued*

from the Amapa mines alone. Brazilian sources estimate eventual exports of 300,000 to 500,000 tons of ore yearly from Urucum and 250,000 tons from Minas Gerais within 3 years, though the Minas Gerais deposits will probably be reserved for the Brazilian steel industry and exports from there may be stopped some time in the future.

Prime advantage to the U. S. in the development of Brazil as an even greater manganese supplier

is one of geography—Brazil is a lot closer to home than other major sources. Closest of these is Africa's Gold Coast; largest and most distant is India.

Sea voyage for the Urucum ore will be longer than the trip from the Gold Coast, but not as distant as the Union of South Africa to U. S. seaports. From the Amapa port of Santana the distance is much shorter than any of the above. This will not only be felt in freight rates but, more impor-

tant if war develops, the shorter routes will not be so dangerous.

A manganese ore procurement bill was introduced in the House of Representatives last week. It would authorize purchase of domestic material at \$1 per long ton unit on a 15 pct basis to \$2.20 per unit for 40 pct ore plus 2¢ for each point up to 60 pct manganese content. These prices would fluctuate with the Wholesale Price Index. Material purchased would be put in the strategic stockpile.

## Expansion

# TOWNS: How to Get New Industry

Communities in which industry is fading can follow a definite program to attract new plants... Resource survey is vital... How to get industrial leads, raise funds—By E. C. Kellogg.

While most of the U. S. has enjoyed prosperity for the last 12 years, isolated areas across the nation have been bypassed by the gold flow. There may be more of these pockets when defense spending is braked.

Pennsylvania has a representative share of these problem towns, despite its lead position in landing certificates of necessity for industrial expansion. Most of the state's trouble spots result from the fade-out of coal mining (THE IRON AGE, Dec. 25, 1952, p. 17).

**Recovery Program**—But through its vigorous Dept. of Commerce, Pennsylvania has done much to revive towns in which industry is waning. The department has worked out a concrete program designed to help towns attract new industry.

First step is formation of a local industrial development committee which should start by making a detailed survey of all its resources. Most important is a detailed labor study listing the types and degrees of skilled workers. In addition, any plant thinking about moving into a town will want extensive information on natural resources, markets, plant sites, tax rates and other factors (see box).

**Evaluation**—A brochure should then be made up based on the survey. It should present a fair accounting of the town's assets and defects. The more honest the analysis, the more useful it will be to the town, and the more valuable it will be to industry.

Leads on firms interested in relocating or opening up branch plants can be obtained from many sources. In Pennsylvania, the Dept. of Commerce sends bulletins to local industrial development groups outlining inquiries it has

received from industry. The number of these leads has averaged 300 to 400 per year. Industrial agents of local power and gas companies, trucking firms and railroads are also good sources, because they are almost equally interested in bringing in new business. Professional organizations

town's development plan. The investigation should include a complete Dun & Bradstreet check of unknown companies, and a study should be made of the personal history of the firm's top management.

Moving a plant or opening a new one is a big step. Often some type of financial inducement is needed. Pennsylvania's Dept. of Commerce, based on the experiences of hundreds of towns, strongly discourages cash gifts or special considerations such as reduced taxes.

A wiser policy is to build or

## What Industry Wants to Know About Your Town

- How much, what kind of labor available?
- What natural resources, raw materials are there?
- Are plant sites available?
- What markets are in the area?
- What are the tax rates?
- What are the town's financial resources?
- How good are transportation facilities?
- What are the waste products of existing industries?
- What materials are purchased by existing industries?
- Is housing adequate?
- Are schools adequate?
- What recreational facilities are available?

such as management engineering firms and industrial real estate companies also help.

**Hand in Hand**—Many towns have been successful in developing their own leads through sources such as *Thomas' Register*. Naturally, it is best to go after firms which can supply raw materials to or use end products of a town's existing plants.

The job of selling a town to industry is like any sales job. Mailing pieces, letters and phone calls are a start, but most important is personal contact between town leaders and prospects.

**Thorough Check**—Once a company has expressed interest in making a move, it should be investigated carefully. The overwhelming majority of firms are reputable, but one sour experience with an exploiter can wreck a

lease a plant for the new industry so that the cost can be paid back over a period of years.

**Fund Raising**—Raising funds for the erection or leasing of a plant is not as difficult as might be expected. Once a community is made aware of the increased employment, boosted payroll and lower taxes that result when new industry is brought in, the money usually comes fairly easily.

**Some Help**—Working in favor of small towns is industry's recent trend toward decentralization. Plants are anxious to get out of congested, labor-short cities. Increased freight rates, estimated to have gone up 50 pct in the last 15 years, are forcing companies to locate nearer their markets, improving the small town's chances of attracting new industry.

## DETINNERS: The Tin Coat Gets Thinner

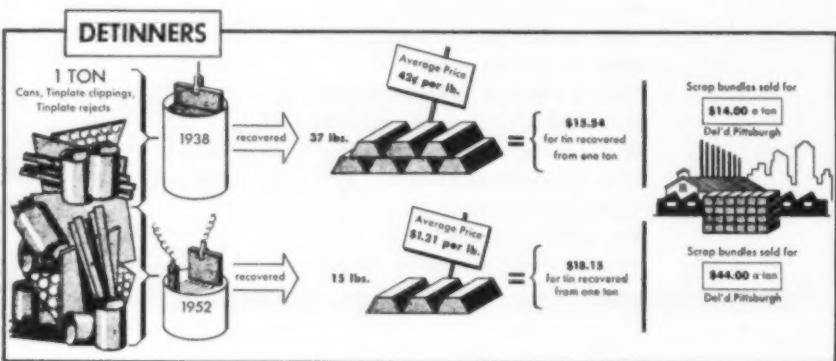
**Before it was so thick you could knock it off with a chisel  
... Now it's down to 15-16 lb per ton of scrap tinplate . . .  
But other factors counterbalance this loss—By T. Metaxas.**

The tin could practically be knocked off with a chisel. So lavishly coated with the strategic metal were the tinplate clippings and cans processed by a new detinning industry 60 and more years ago that each ton would yield from 80 to 90 lb of tin.

Before hot-dip tinplating started to decline in favor of the electrolytic method, production refinements had lowered the tin take to a still respectable 37 lb per ton of scrap material. Today the hot-

longer and faster. What governs production volume of the industry is availability of clippings, plate rejects, and cans. As is indicated by the excess capacity, competition for raw materials is vigorous, and bidding at canmakers and mills is shrewd and serious. The right bid for clippings at a canning plant can result in an instant contract.

Once he buys his scrapped tinplate from canmakers, steel mills, and others a detinner will punch



dip plating process is being fast made obsolete by electrolytic tinplating which permits finer coatings of varying thicknesses on either side of the plate—and the tin yield is sinking even below 15 to 16 lb per ton.

Many are asking a natural question: How can the detinning industry continue to make money? And the answer is that improved methods, stronger demand for tin and scrap steel bundles at higher prices, and climbing tinplate production more than counterbalance the unfavorable factor of less tin on cans.

**Supply**—While processing about 500,000 tons of material per year, the detinners have a capacity to treat 685,000 tons—and possibly more if they run their plants

it and slit it for immersion in a caustic soda bath to dissolve the tin. Most laborious job is loosening the bond between tin and steel. With the electrolytic process tin is recovered from the bath and melted into pigs of 99.8 purity—as fine a grade as can be extracted from ore. Also recovered are tin chemicals and oxide.

Hydraulic presses convert the detinned clippings and cans into No. 1 scrap steel bundles for sale to steelmakers at prime prices. The steel and scrap industries can thank the detinners for almost 500,000 annual tons of choice scrap, containing consistent quality steel suitable for openhearts.

Five companies in detinning operate seven scattered plants. One of these is the captive shop of Weirton Steel Co., functioning

on rejected tinplate. Others are Metal & Thermit Corp., its subsidiary Tin & Chemical Corp., Vulcan Detinning Co., and the newly built Chicago Detinning Co., an offshoot of the late Batavia Detinning Co., Batavia, Ill.

**More Tinplate**—Buttressing rising prices for tin and scrap bundles is the considerable climb of tinplate production. In 1938 tinplate output was 2,505,636 tons, principally hot-dipped. In 1951 1,566,199 tons of hot-dipped was made and 2,874,851 tons of electrolytic—for a total 4,440,222 tons. Perhaps because of skimpier coatings the detinning industry's tin yield has not varied greatly, but compare the average 42¢ per lb paid for tin in 1938 to the average for 1952—\$1.21.

And then consider that 1938 scrap bundles sold delivered at Pittsburgh for \$14 or so and even under controls today sell at a sleek \$44.

With a fair profit in mind and costs of production not dissimilar within the industry, detinners can pay so much for scrapped tinplate material. Unless the canmakers wish to stockpile their scrap they must sell at a price detinners can pay.

Detinners in 1951 recovered a total of 4071 tons of tin, of which 3992 tons came from 481,443 gross tons of tinplate clippings and 22,131 tons of old cans. Yet this 4071 tons of tin is a piddling fraction of the 57,000 tons consumed by America yearly. No matter how fractional its contribution, the industry is ranked as strategic because our tin sources are far-flung and insecure.

**How Safe?**—Our principal suppliers, Malaya, Indonesia, and Thailand, are being gored from within by the communists. Bolivia's political immaturity resulted in a hot-headed nationalization of tin mines and the Belgian Congo may be troubled by racial unrest.

The scrap generated by detinners may be just as important as

the tin. It will find a constantly eager market in the steel industry, jittery even now over future shortages.

With the steel and scrap industries ready to donate the pedestal, detinners have a special shrine reserved for the man discovering an economically feasible way to reclaim a goodly percentage of the 2,750,000 tons of steel and tin irretrievably lost each year in the nation's garbage pails as tin cans for food.

**Helpful Flop**—Under the goad of patriotism in World War II, the public trimmed and flattened its tin cans but even with this stimulus the drive was not wholly successful. Out of a great potential only 175,000 tons of old cans were collected in the peak year of 1943. Costs of labor and transportation exerted an economic vise on the project. Tin can piles sometimes became community eyesores which dampened the can collecting programs.

With a permanent new source of valuable scrap tantalizingly in sight and a scrap shortage hurting the steel industry, tin can salvage was tried once more in early 1952. In three cities a potent charity appeal was dangled. Housewives and local business worked to aid local charities and the take did exceed that of World War II but it was still 15 pct of the possible total. Local industry found the procedure too costly in time, trucks and men and preferred sending their checks to charities rather than snarling up business schedules.

When the scrap shortage waned the experiment was abandoned permanently.

Now city dumps crammed with beaten and dirty cans are being eyed speculatively. At this time the problem seems insoluble. Perhaps tin can collection may be organized by municipal sanitation departments which would make special provisions for tin cans. But first it must be shown that there's a profit possible. Charity and patriotism don't seem to work.

## LABOR: Profit Split Pays Two Ways

**Profit sharing plan at Bath plant helps both management and labor . . . Result is more pay, more production and no strikes . . . Labor is given voice in policy decisions—By R. M. Lorz.**

A partnership of management and workers at the Cyril J. Bath forming equipment plant in Cleveland gives employees a fatter pay envelope and a chance to decide company policy, while management gains through increased productivity.

Under the profit sharing plan, Bath employees annually receive more than 50 pct of the firm's retained earnings in cash bonuses, dividends, insurance and pensions. Value of these benefits for each worker averages 10 pct of yearly wages, and in addition each employee is covered by an insurance policy worth about 150 pct of annual pay.

**Production Up** — But cash awards to employees aren't the only results of the labor-management partnership. In effect for 33 years, it has helped make Bath a virile, growing concern. Value of the company's production in 1947 topped the \$1 million mark, about double the average of the war years. Last year, value of company output almost doubled again, being worth more than \$1.8 million.

Indicative of the close relationship between management and labor at Bath is the friendly atmosphere of the cafeteria where workers, foremen and executives meet three times a day for free coffee, doughnuts or soup. The snack periods are a regular feature, and management has learned that the way to increased production and efficiency is sometimes through the stomach.

**Defense Work** — After the breaks, the casual atmosphere disappears and about 100 workmen return to the job of turning out tools and parts for jet engines, guided missiles and other vital defense items. Little pressure is

needed to keep production and quality high because every man in the shop has a definite stake in the end product.

Labor has a strong voice in company policy. Through meetings of a committee composed of five shop representatives and four management men, the workers have a chance to guide planning, designing, establishment of departments and purchases of new equipment and supplies. Labor also gives advice on price policy and is equally responsible with management for handling layoffs and grievances.

No one is in the dark concerning the firm's operations because a financial "pie" hanging in the cafeteria shows exactly what the company did with its money in 1952.

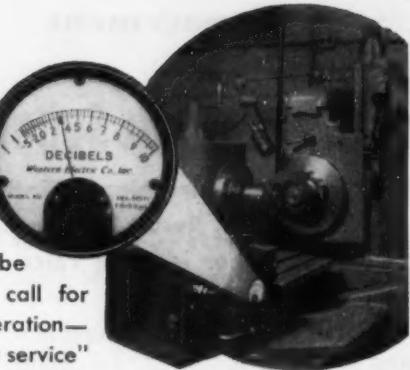
**From the Floor**—Because management knows that not all ideas originate in the front office, some profitable suggestions have come in from the floor. On some occasions machine operators have solved difficult problems.

Another innovation is the policy of letting the workers get out of the plant. If a customer complains about the quality or operation of a certain tool or part, quite often the men who have machined it will leave the production line, hop a train or plane, and work on the problem with road men. In that way the monotony of daily routine is broken and the workers see what happens to the things they make.

**Happy Homes**—Job satisfaction also seems to result in a happier home life for the workers. Statisticians at New England Insurance Co., which handles the Bath account say drunkenness, absenteeism and marital troubles aren't as frequent as is normally expected. Also there has never been a strike at the Bath Company.

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## BUDGET: How Much?

Congress hopes to pare budget by as much as \$10 billion . . . Calls proposed expenditures "Fantastic."

Congressional leaders, scoring President Truman's proposed \$78.6 billion budget as "fantastic," this week whetted their fiscal pruning knives in anticipation of cuts that may total as much as \$10 billion.

But Democratic leaders sided with the White House in maintaining that the huge new spending bid—including \$46.3 billion for military programs and procurement—carries no "fat." It's a "realistic" budget, says Rep. Clarence Cannon, D., Mo., ranking minority member of the House Appropriations Committee.

Scheduled tax reduction this year, to which President-elect Eisenhower and his Capitol Hill lieutenants are definitely committed, makes some spending cuts mandatory. And there's firm assurance from Republican leaders that both tax reduction and reduced expenditures will be voted at the current session of Congress. Mr. Eisenhower's aides say the new Administration will make its budget views known about March.

**Peak Defense** — Mr. Truman pitches his pleas for a \$46.3 billion military checkbook on the theme that fiscal 1954 will be the "peak year" in the armament build-up against communism. It is the largest requested since World War II.

Specifically, the White House proposes the following spending figures for the three services:

|                 |                  |
|-----------------|------------------|
| Air Force ..... | \$17,470,000,000 |
| Army .....      | \$15,358,650,000 |
| Navy .....      | \$11,804,000,000 |

Aircraft procurement would total \$8.7 billion under the budget proposal. This envisages an Air Force of 143 wings, with 133 in operation by mid-1954. Although Army and Navy appropriations would be held to about their pres-

## Much Can Be Cut?

ent levels, each would be permitted to order substantial quantities of new weapons. Procurement of guided missiles would be increased by all three military services.

Total military spending actually may hit a high of \$48 million during the new fiscal year if Congress approves \$41.5 billion in new de-

### Budget Highlights

Estimated expenses—\$78,587,000,000, including \$46,296,000,000 for military programs.

Estimated income—\$68,665,000,000, which allows for a \$2 billion loss resulting from scheduled tax cuts.

Estimated Deficit — \$9,922,000,000.

Taxes—reductions should be cancelled, Mr. Truman says, and further cuts should not be voted in order to meet his estimates of armament costs.

fense appropriations and if production is not set back by strikes.

Here's what Mr. Truman proposes in the way of major expenditures during the new fiscal year:

**Military**—\$46.3 billion, of which \$8.7 billion is earmarked for planes, and another \$1 billion for ships, including a third super carrier.

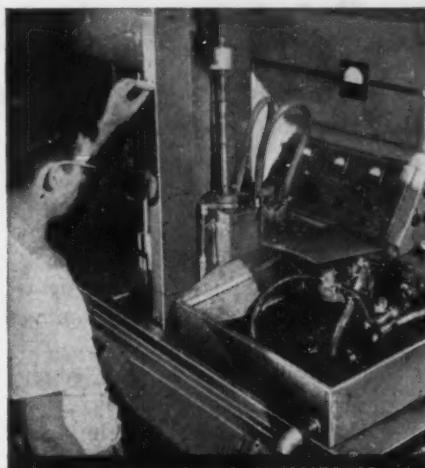
**Atomic Energy**—Spending program would amount to \$2.7 billion—an increase of \$700 million over this year.

**Natural Resources**—\$325 million is asked for eight new river basic projects and for five additions to existing projects.

**Foreign Aid**—Total \$7,559,000,000 is asked for military and economic aid abroad.

**Agriculture**—Farm spending can be cut by \$116 million, Mr. Truman estimates. Total asked is \$1,827,000,000, as compared with \$1,943,000,000 for the current fiscal year.

## From Tractors to Textiles

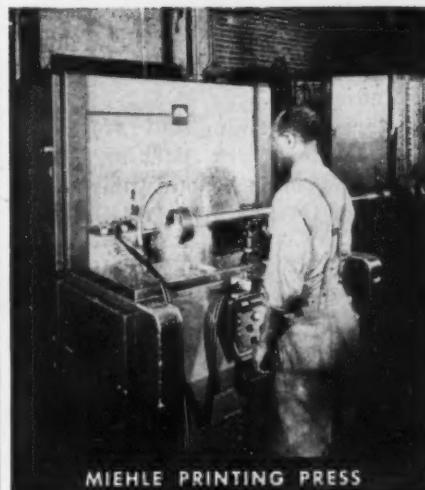


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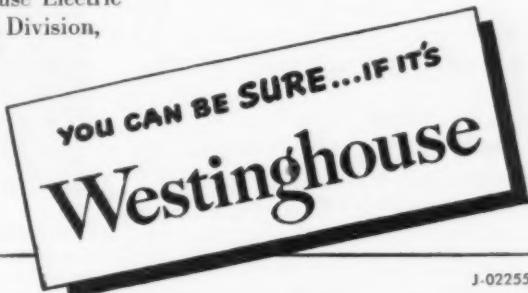
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J-02255

## STEEL: Capacity Growing Pains

**Leap-frog capacity growth causes temporary bottlenecks in production . . . Product-mix also a factor . . . Blooming mills, soaking pits are overloaded now—By K. W. Bennett.**

Gigantic steel expansion is not without its growing pains. Leap-frog nature of capacity additions is causing temporary capacity bottlenecks in all areas and in nearly all expanding companies.

The trouble is that a growing company can't turn on all new capacity gradually and uniformly. In some cases new finishing mills are completed before new openhearts are ready to pour steel. Or new openhearts start pouring ingots before blooming mill capacity is ready to break them down.

Actually, the above examples over-simplify the problem; there are many types of equipment in integrated mills and capacity balance is constantly being shifted during time of expansion.

**Balance Coming**—When current huge expansion programs are completed, most mills will have better balanced capacity than they had when they started expanding. Meanwhile they are feeling plenty of capacity growing pains, made sharper by high customer demand.

Right now one of the biggest bottlenecks in the steel industry is blooming mill capacity, though there are signs that it will soon ease.

There are reports of a mill laying up ingots due to a lack of blooming space—a mill shipping ingots to the Midwest for blooming, then back East for flat-rolling—a mill shipping in hot-rolled coils for rolling into cold-rolled strip.

Some of these operations are like intra company conversion deals, and they add to steelmaking costs.

**Why the Squeeze?**—The big squeeze on blooming capacity is aggravated by (1) a huge, rapid influx of new ingot capacity; (2) over-age blooming mills that are beginning to stagger; (3) continu-

ing pressure from the conversion steel market; and (4) steelmaking and finishing capacity being completed ahead of new blooming mills.

On the credit side of the ledger an increasing number of purchasing agents are balking at the high cost of conversion steel. This includes oil country goods and construction equipment, long badly in need of steel. Expectation is that conversion pressure, though admittedly still high, will gradually ease instead of increasing (auto and appliance schedules notwithstanding).

Already helping out are companies that are pushing their blooming mills beyond their rated capacity. Sometimes this makes

substantial new capacity available. Reason is that a number of blooming mills have been arbitrarily rated at the capacity of the steel-making furnaces they serve. Pushing these mills to their real capacity has resulted in processing of more ingots than looked possible.

**Helping Out**—For example one mill paper-rated at the output of millsite furnaces has handled constantly increasing local output over the last year, and 2 months ago was able to take on surplus ingots from ingot-surplus sister mills in the East. Now its sister mills are able to roll their own.

At least four new blooming mills will soon be ready to help break down growing ingot capacity. In addition to helping ease the blooming squeeze they will obviate much of the storage and transshipment of ingots that have been running up costs.

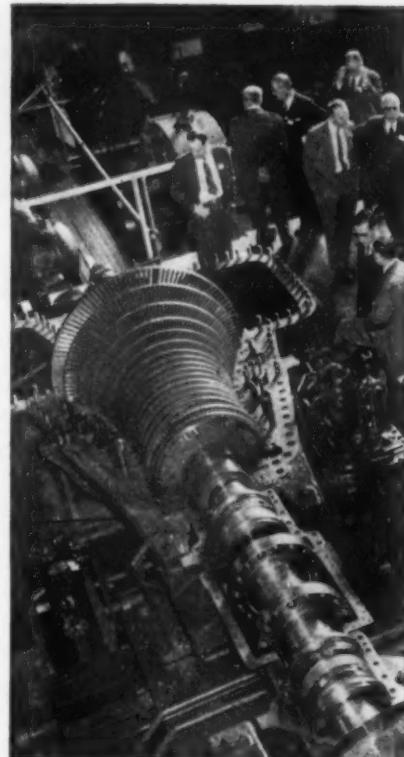
Open blooming space is expected to become easier to find.

**Hot-Top Trouble**—Though not so easily spotted as blooming bottlenecks, soaking pits are also overloaded. Changes in product-mix caused by military orders are largely responsible.

The military wants a large share of hot-top quality steel, production of which extends soaking pit time beyond that of ordinary carbon steel by a ratio of roughly 1:2 1/4. Result: overloaded soaking pits, less steel through the blooming mill, and less steel for finishing mills.

One mill geared to produce 20,000 tons of hot-top steel per month has been pushed to 47,000 tons by government directive. This hardship will be corrected by soaking pit expansion in the second quarter. Another mill has avoided this pitfall by ducking hot-top orders.

In new plants, such as the Fairless Works, capacity will be unbalanced for many months. Ingot production is being stored pending completion of the blooming and slabbing mill and the hot strip mill. Cold-rolled strip is being produced from hot-rolled coils shipped from Pittsburgh.



**BIG WIND:** Steel executives inspect one of the two giant blast furnace turbo-blowers built for Armco Steel. Total weight is more than 167 tons.

# SCRAP: Celebrate 25 Years of Progress

Institute of Scrap Iron & Steel holds silver anniversary in New York . . . Industry once chaotic but has taken great strides . . . Takes vital role in economy—By T. Metaxas.

The men who made scrap iron and steel into what is one of America's most vital "natural" resources are gathered this week in New York for the 25th annual convention of the Institute of Scrap Iron & Steel. This is a proud meeting dedicated not only to review of accomplishment but to plans for progress.

On Monday, at the Silver Anniversary Commemoration, even the looking-back speeches were a blend of looking-forward. The early strivings necessary to organize a fiercely individualistic industry operating in fragments were described by scrap industry leaders.

Before formation of the Institute, the industry was mute when it came to making itself felt, impotent to formulate policy on a national scale. Meanwhile as Bessemer converters were supplanted by openhearts a widening market for scrap was appearing.

**"Deplorable State"**—Scrap was at the crossroads. It had to organize and by so doing reach some standards of operation.

Reporting to the convention, the Institute's first secretary, Herman D. Moskowitz, vice-president of Schiavone-Bonomo Corp., said, "In the winter of 1927-28 conditions in the scrap trade were deplorable. We lived in a time of profitless prosperity, when dog eat dog was part of the common language."

Yet at that time scrap shipments were rising steadily and the number of openhearth furnaces was increasing. The Bessemer

converter which gave the American steel industry its start was a user of ore while the larger openhearts could expeditiously operate on a 50 pct scrap charge.

The progress of the scrap industry is reflected in these statistics: In 1910 just over 6 million gross tons were used and by 1917 collections had doubled. In 1919 scrap consumption declined with roller-coaster speed but the setback was temporary, for in 1920 about 15 million tons were consumed. By 1927 scrap use had reached 20 million tons and from then on the climb was sharp.

**Regional Group**—A comparatively few men planned to lift the

industry out of disunion with an association, permit it to mature so it could take its crucial role in the economy. The first office of the scrap association opened in New York. At first the association was regional but it swung over to national coverage.

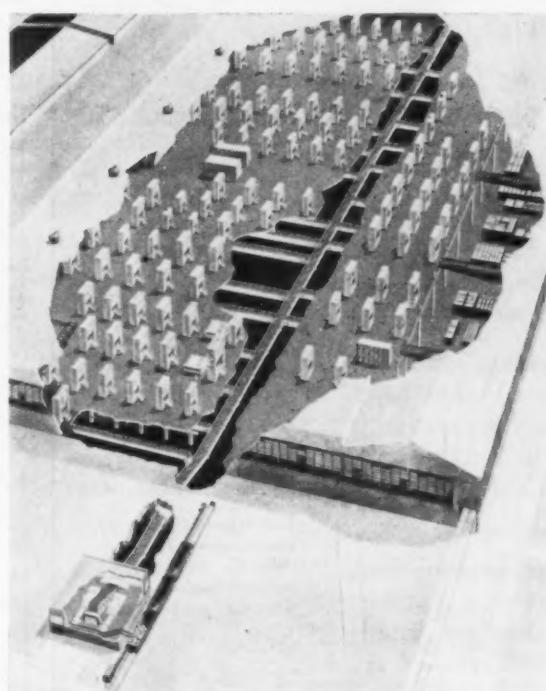
Its first Director General, Benjamin Schwartz, now of Benjamin Schwartz Co., was a prime mover in founding the Institute. His slogan called for organization, ethics, fair practices. And the success he had in converting many rabid individualists to the cause was clear evidence that scrap men were ready to become big business.

Today the scrap industry has retained its character of virility and has continued to be a great many small businesses comprising a giant one. The billions of dollars spent on plants and equipment have come for the greater part from private pockets. Scrap men invested in themselves and a sure future in the growth of steel.

Although the scrap industry is closely linked to the steel industry it has maintained its independent character.

**Shipments Mount**—Last year even with a 54-day steel strike that saw scrap join steel as an unwilling partner in near shutdown the industry shipped more than 30 million gross tons of scrap. This year shipments may push near or over the 35 million ton mark. Today the scrap industry has glutted the yards of steel mills. A shortage this winter is not considered likely, although harsh winter weather could tighten supply considerably. Dealer-level stockpiles are low in many areas.

**Acknowledged**—Speakers gave much of the credit for organizing the industry to trade newspaper publisher Charles Lipsett, who put himself wholeheartedly into the new movement.



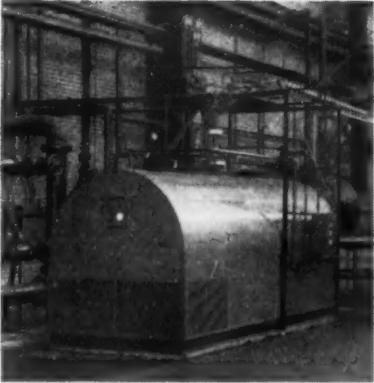
**SCRAP CONVEYER:** A giant scrap conveyor, said to be world's largest, has been constructed for General Motors Corp.'s Grand Rapids Plant No. 1. The conveyor, which carries scrap from main plant to baler house, can handle 500,000 lb per day. Twenty collecting conveyors, which travel at right angles to the main belt, receive loose scrap from a chute under presses on the floor above and carry it to the main conveyor.

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## TRUCKS: More Potent

Industry invests \$2.6 billion...  
Operating fleet now is about  
8,830,000 units.

Motor transport last year made firmer than ever its position as a major factor in the national economy.

During 1952, the trucking industry invested \$2.6 billion in new equipment and added close to 500,000 new employees to its payrolls, the American Trucking Assns., Inc., estimates.

Specifically, the industry as a whole bought 965,000 new trucks and tractors and 55,000 new trailers during the year. This made a net increase of 207,000 units for the nation's operating highway transport after allowance for retirement of old equipment.

**Size of Fleet**—Thus, the operating truck fleet is estimated at 8,830,000 units, after making allowance for retired and non-operating units. This does not include 65,000 trucks owned by the Federal Government, nor an unestimated number operated by military services and state governments.

Commercial trucking data indicates a total overall employment of better than 6 million persons—about one job in ten for the nation. This makes the industry the second largest employer, topped only by agriculture. Total payrolls are in excess of \$21 billion.

**Truck Production**—Turning to the industrial side, the automotive industry produced 1,222,000 trucks and buses during 1952, valued at more than \$2.4 billion, it is estimated by the Automobile Manufacturers Assn. These totals are based on fairly complete figures.

Ton-miles of commercial service increased by 7 billion during 1952, raising the total volume for all private and for-hire carriers to about 140 billion ton-miles.

Automotive companies have un-

## Potential on the Roads

undertaken more than 40 plant expansion and conversion projects since Korea. A substantial portion of these are reported as completed.

### STEEL:

**Midwest fabricators back steel industry committee on decontrol.**

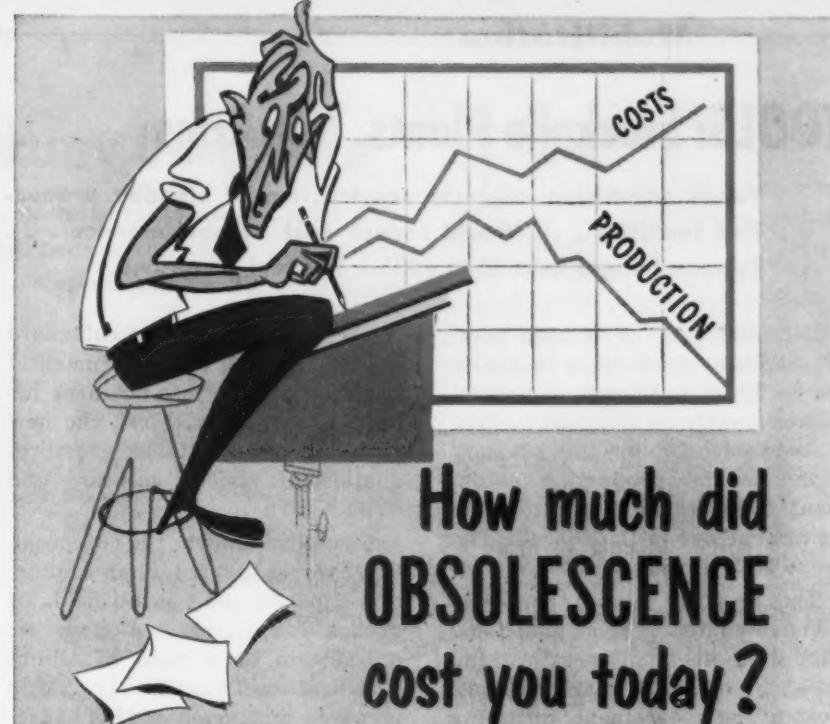
Fabricators in the Midwest last week aimed one last salvo at the battered bureaus along the Potomac. A recent meeting of the Central Fabricators Assn. drew up four resolutions, dropped them in the Washington mail, and are waiting for the repercussions. Their resolutions:

(1) Support the Steel Products Industry Advisory Committee in recommending progressive decontrol of the steel industry, with a continuation of military steel "set-asides."

(2) If, as NPA has stated, overall military usage of steel is about 12 pct, then the 24 pct set-asides on plates and the 18 pct set-aside on shapes, should be brought into line with actual military demand.

(3) Return warehouse allotments from steel mills to an actual historical pattern.

(4) Burden of directives on Midwestern steel mills should be reduced, and fringe area mills should be required to up their government-directed tonnage, wherever these fringe mills are not being utilized to full capacity.



## How much did OBSOLESCENCE cost you today?

The fastest way for a machine to become obsolete is for someone to develop a new machine to do the same job faster, better, and more economically.

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1903  
1953  
FIRST FIFTY YEARS  
**CLARK EQUIPMENT**

## TOOLS: Stockpile Plants, Not Arms

Vance committee suggests construction of standby production facilities . . . Would reduce cost of obsolescence . . . Truman budget asks \$500 million to start programs.

Establishment of a high level of defense production capacity by building additional industrial plants, mostly on a standby basis, is recommended by the advisory committee on production equipment (The Vance Committee) in its final report to the Office of Defense Mobilization.

This proposal calls for construction and equipping of an additional \$2 billion worth of metalworking capacity, including machine tools. Cost to the government, including maintenance, would average out at about \$500 million a year for the next decade.

"We see no hope of being able to let down our defense and security efforts for another 10 years," committee chairman Harold S. Vance, Studebaker president, says.

In view of this conclusion, the committee feels that it is both safer and cheaper to "stockpile" productive capacity than to try to build and keep current a stockpile of military end items.

**Expensive Antiques**—For example, it is pointed out that if an inventory of 5000 tanks became obsolete, it would mean a loss of at least \$1 billion. But the cost of maintaining tank production facilities up-to-date to meet changing needs and designs would be only a fraction of that cost.

Today's investment in metalworking capital equipment is estimated at more than \$32 billion. The government's interest in this investment — including machine tools and metalworking equipment in inventory, on lease, and subject to recapture — is estimated at about 20 pct.

If the proposed \$2 billion worth of new capacity were built, the governmental ownership of tools and equipment is estimated to be increased by only about 5 pct to about 25 pct.

The committee would safeguard industry against any governmental temptation to go into business for itself in two ways. First, the new capacity would be largely for production of strictly military end items.

Secondly, under the proposal, ODM would first establish production capacity goals in all fields of probable military end item requirements on a basis of all-out mobilization. Then industry would be asked how much of this capacity it would like to build and convert to civilian type production.

**Give Incentives**—If any could be so used, the government would extend tax amortization privileges and other incentives for privately financed construction, retaining recapture and conversion rights.

In many fields, it is held, there would be no need for increase. In some, such as the automotive industry, capacity is already either adequate or will become so.

Postwar operations of both the first and second World Wars were sharply criticized by the committee in support of the program. These permitted industrial plants and equipment for military types

of production to "deteriorate or be liquidated."

Because of the lead-time in getting plants built and equipped with metal-working equipment, the report declares that "outmoded production equipment and processes are still being used for important military items, such as rifles."

Preliminary steps have already been taken to get the proposed program rolling. Mobilization Director Henry H. Fowler, Chairman Vance, former ODM troubleshooter Clay P. Bedford, and other committee members have already gone into a huddle with Senators Burnet R. Maybank, D., S. C., and Homer E. Capehart, R., Ind., ranking members of the Senate-House committee on defense production. This was to let this important committee in on what is proposed. Some legislation and some funds will be needed to authorize such a program.

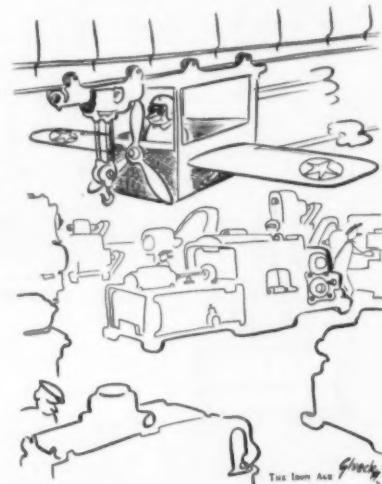
**Talk of \$1 Billion**—The Truman budget submitted last week contained a request for \$500 million as a starter. This was only one-half the figure being talked of before the change in political administration.

As previously stated, about \$2 billion would be laid out for plants and original equipment. On a long-range basis, cost of maintenance, including replacement and conversion of machine tools which would become obsolete with changing design and techniques, is estimated at \$400 million annually.

This would provide a substantial support for the machine tool and other metalworking equipment industries. The \$500 million would be roughly split up into \$300 million for machine tool procurement and \$200 million for all other metalworking and capital equipment.

It is admitted that only guesses can be made as to the division of the funds.

The government already owns or controls some 550,000 items with an inventory value of \$6 billion. Another \$2 billion would be added under the proposed program.



## METAL POWDER: Industry Using More

**Iron Age survey shows U. S. metalworking used almost \$39-million of metal powder parts, bearings in 1951 . . . Use was at least that great in 1952 . . . Copper-tin powder used most.**

Manufacturers of everything from fishing reels to artillery shells used almost \$39 million of metal powder parts and bearings in 1951, a new IRON AGE survey shows. And 96 pct of them used as much if not more in 1952.

In an attempt to determine amount of use and applications for metal powder parts, THE IRON AGE's Research Div. surveyed metalworking plants across the country. Replies from 979 firms show 413 using metal powder parts and bearings in some 312 applications.

Of the plants using metal powders, 328 were able to supply dollar purchase information for 1951. Total was \$5,009,651, of which \$2,45,861 was for bearings and bushings and \$2,463,790 for mechanical and electrical parts.

**Use More**—Of 396 users, 207 reported they planned to make greater use of metal powder in the future, and 173 will use the same amount. Normal statistical expansion shows that for all of metalworking total expenditures for metal powder parts ran an estimated \$38,858,632 in 1951.

Copper and tin was by far the most widely used powder for bearings and parts, with 278 plants reporting its use. Other metal powders used included:

|                 |           |
|-----------------|-----------|
| Iron            | 98 plants |
| Iron & Copper   | 85 plants |
| Brass           | 82 plants |
| Copper          | 39 plants |
| Carbon Steel    | 18 plants |
| Stainless Steel | 8 plants  |
| Aluminum        | 3 plants  |
| Other Metals    | 19 plants |

Fabricators can look forward to good supplies of powdered metal, assuming the metals picture does not make a drastic and unexpected change. Powder people are expanding facilities, making sure that there will be no lack of capacity. One iron powder producer, for

example, is putting the finishing touches on a new plant in the East. Capacity there alone will be 28,000 tons annually.

ports are high, and the future is optimistic.

Army Ordnance had made some dramatic announcements on use of iron powder in shells, but lately has been dragging its feet. Main reason is the development of steel cartridge cases. This frees enough copper to allow its use in rotating bands, one of the main proposed uses for powder. But the big future of powder metallurgy is in

### Metal Powder Users By Industry Groups

| Description of Industry Groups    | Plants Reporting | Plants Using Powder Metal Parts | Plants Using P. M. Bearings | Plants Using P. M. Mech. Parts |
|-----------------------------------|------------------|---------------------------------|-----------------------------|--------------------------------|
| Ordnance & Accessories            | 17               | 10                              | 7                           | 7                              |
| Metal Furniture                   | 20               | 2                               | 2                           | 1                              |
| Fabricated Metal Products         | 142              | 38                              | 25                          | 16                             |
| Machinery (except elec.)          | 550              | 247                             | 231                         | 70                             |
| Electrical Machinery & Equip.     | 130              | 56                              | 35                          | 38                             |
| Transportation Equip.             | 94               | 40                              | 11                          | 18                             |
| Instruments, Photo Equip., Clocks | 37               | 22                              | 17                          | 14                             |
| Misc. Metalworking                | 9                | 3                               | 3                           | 1                              |
| <b>Total for 979 Plants</b>       | <b>979</b>       | <b>413*</b>                     | <b>354</b>                  | <b>172</b>                     |

\* Of these 413 users, 25 are using powder metal parts only experimentally, but expect to use them in production in 1953; 47 of the non-users are currently investigating powder metal parts. Some of them will become users.

Some fabricators feel that 25,000 tons of iron powder per year would be enough for the near future. But executives of powder-making firms are sure that 50,000 will not be too much by the end of '53. Business is definitely on the upswing after a dip in 1951, im-

civilian industry, which shows more and more interest.

The biggest surges in powder metallurgy are taking place with iron powder. Iron sinterings are beginning to compete with stampings and deep drawings as well as sand cast or die cast parts.

### Metal Powder Purchases

| <b>Metal Powder Purchases</b>               |  | <small>Powder Metal Parts<br/>Used in 1951 by the<br/>Metalworking Industry—\$</small> |
|---|--|--|
| <b>Ordnance</b>                             |  | <b>\$264,515</b>   |
| <b>Metal Furniture</b>                      |  | <b>78,006</b>  |
| <b>Fabricated Metal Products</b>            |  | <b>3,774,715</b>   |
| <b>Machinery</b>                            |  | <b>(except Electrical)</b>   |
| <b>Electrical Machinery</b>                 |  | <b>&amp; Equipment</b>   |
| <b>Transportation Equipment</b>             |  | <b>17,291,773</b>  |
| <b>Instruments, Photo Equipment, Clocks</b> |  | <b>680,129</b>   |
| <b>Miscellaneous Metalworking</b>           |  | <b>200,200</b>   |
| <b>Estimate for Metalworking Industry</b>   |  | <b>\$38,858,632</b>  |

## Controls

### Industry Controls This Week

**Auto Parts**—Amend. 1, CPR 139 permits sellers of used automotive parts who find it difficult to use the CPR 139 pricing formula to apply to OPS for approval of their own price computing methods.

**Bauxite**—Amend. 30, GOR 9 exempts price controls on two categories of bauxite ore sales between affiliated corporations.

**Machinery**—Amend. 42, CPR 30 permits manufacturers of machinery and related products to use either actual or estimated payments for conversion steel, including costs of transporting and converting it, to determine whether they are entitled to ceiling price adjustments because of the increased cost of conversion steel. The amendment also allows machinery producers to recompute an existing conversion steel adjustment each month, bi-monthly or quarterly. Amend. 4, SR 4, CPR 30 provides machinery manufacturers with a method of computing an "overhead cost adjustment factor" which can be used to determine Capehart price increases. It can be used for a product line, category or an entire business. Amend. 3, SR 8, CPR 30 gives manufacturers the option of using either SR 4 or SR 8 to determine Capehart adjustments.

**Molds**—Amend. 43, CPR 30, Amend. 5, SR 3, CPR 30 clear up misunderstandings relating to the status of ingot molds and stools by pointing out that stools and molds are covered under CPR 60 and not by CPR 30.

**Nickel**—GOR 35 allows seven U. S. wholesalers to boost the price of nickel 3½¢ per lb to allow for the increased cost of Canadian nickel.

**Petroleum**—Amend. 2, CPR 13 permits an increase in the price of petroleum products based on pass-through of transportation cost increases. It also requires reduction of ceiling prices in instances where taxes have been lowered or repealed.

**Pipe**—Dir. 7 M-46 and Dir. 5, M-46A outline specific conditions under which oil and gas operators may trade with foreign countries for new oil country tubular goods and pipe.

**Scrap**—Amend. M-16 permits certain scrap dealers to discontinue reporting end-of-month inventories, purchases and sales of copper raw materials and scrap.

**Steel**—Dir. 2, M-50 restores steel inventory ceilings for electric utilities.

## Defense Contracts

### Contracts Reported Last Week

Including description, quantity, dollar values, contractor and address. Italics indicate small business representatives.

Repair parts for diesel engines, 4750, \$44,597, The National Supply Co., Springfield, Ohio.

Repair parts for pumps, 2032, \$27,076, Sherwood Brass Works, Detroit.

Repair parts for compressors, 5030, \$76,883, Ingersoll Rand Co., Philadelphia.

Repair parts for diesel engines, 4173, \$32,973, Nordberg Mfg. Co., Milwaukee.

Repair parts for reduction gears, 1274, \$29,287, The Falk Corp., Milwaukee.

Repair parts for diesel engines, 26586, \$62,428, American Bosch Corp., Springfield, Mass.

Repair parts for diesel engines, 3852, \$66,718, General Motors, Cleveland, *A. O. Cash*.

Repair parts for measuring instruments, 1905, \$34,875, Weston Elect. Instr., Newark.

Repair parts for refrigeration equip., 4206, \$43,417, Carrier Corp., Syracuse, N.Y.

Repair parts for pumps and compressors, 12266, \$144,345, Worthington Corp., Harrison, N. J.

P & W tools for engines, var., \$111,336, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Maintenance & spare parts, var., \$1,512, 318, United Aircraft Corp., East Hartford, Conn., *E. E. Champion*.

Fuel valves, var., \$50,104, Koehler Aircraft Pro., Dayton.

Wheel & Brake assys, var., \$298,261, The Goodyear Tire & Rubber Co., Akron.

Hydraulic pump assys, var., \$176,100, N. Y. Air Brake Co., New York.

Actuator for aircraft, var., \$224,264, Lear, Inc., Grand Rapids.

Maintenance parts, var., \$221,553, Glenn L. Martin Co., Baltimore, *P. T. Russi*.

Replenishment of hardware, 458836, \$148, 746, Chase Brass & Copper, Waterbury, Conn.

Replenishment of hardware, 29460000, \$152,662, Industrial Supply Co., Detroit.

Replenishment of motor vehicle parts, 2500, \$121,825, Borg-Warner Corp., Mundelein, Ind.

Replenishment of motor vehicle parts, 7000, \$66,553, Bendix Westinghouse Air-Brake Co., Elyria, Ohio.

Replenishment of hardware, 89000, \$50, 374, General Motors Corp., Detroit, *R. C. Campbell*.

Replenishment of hardware, 227500, \$40,335, Lamson & Sessions Co., Cleveland.

Replenishment of motor vehicle parts, 1300, \$34,983, Marlin-Rockwell Corp., Jamestown, N. Y.

Replenishment of hardware, 287600, \$52,496, National Mach. Prod., Utica, Mich.

Replenishment of tool, 10, \$40,962, Neff Equip. Co., Toledo.

Replenishment of hardware, 65000, \$110,175, Roller Bearing Co. of America, Trenton, N. J.

Replenishment of tool, 100, \$39,486, Stewart-Warner Corp., Chicago, *E. N. Osterberg*.

Fuze, P1, M90A1, 909000, \$594,131, Aerotex Prod., Inc., Fairfield, Ill.

Shell HE, M306A1, 715000, \$876,222, Aerotex Prod., Inc., Fairfield, Ill.

Shell, HE, 150000, \$149,000, American Car & Foundry Co., New York.

Bomb, GP, 113600 ea, \$930,043, Pyrene Mfg. Co., Newark.

Head metal parts assy for rocket heat, 3.5 M28A2, 52500, \$987,000, Hubeny Bros., Inc., Roselle, N. J.

Valve assy, var., \$111,862, AiResearch Mfg. Co., Los Angeles, *James B. Myer*.

Tube, pitot, 3392 ea, \$35,616, Aero Instrument Co., Cleveland.

Support assy, var., \$49,066, Solar Aircraft Co., San Diego, Calif.

Parts for aircraft, var., \$63,295, McDonnell Aircraft, St. Louis.

Pump assy, 95 ea, \$105,009, Nash Engr. Co., South Norwalk, Conn.

Motor, 200, \$25,315, Firechild Camera & Instr. Corp., Jamaica, N. Y.

Maintenance parts for aircraft, var., \$94,385, Air Associates, Inc., Teterboro, N. J.

Maintenance parts for aviation armament, var., \$318,545, Douglas Aircraft Co., El Segundo, Calif., *W. H. Hough*.

Sleeve assy, 855 ea, \$30,780, Weston Hydraulics, North Hollywood, Calif.

Maintenance parts for var aircraft, var., \$141,117, Airborne Accessories, Hillside, N. J.

Actuators & box for var aircraft, var., \$38,710, Foote Bros. Gear & Machine Corp., Chicago.

Fuze, pd., 1178000 ea, \$882,086, Havill Corp., Los Angeles.

Fuze, pd., 823000 ea, \$654,285, Pfister Mfg. Co., Los Angeles.

Primer, percussion, 6190, \$66,807, Olson & Rice, Inc., Los Angeles.

Cap, magazine, 750184, \$41,476, U. S. Brush Co. of Omaha, Omaha.

### Government Inviting Bids

Latest proposed Federal procurements, listed by item, quantity, invitation No. or proposal and opening date. (Invitations for Bid numbers are followed by "B" requests for proposals or quotations by "Q.")

**Navy Purchasing Office, San Francisco**, Piston, 284 en, 11827-P2-Q, Jan. 13. Valve, 17726 en, 11853-P2-Q, Jan. 13. Valve, 2566 en, 11853-P2-Q, Jan. 13.

**General Stores Supply Office, Philadelphia**, Drums, steel, 8400 ea, 2 1260 B, Jan. 24.

**Bureau of Ships, Washington**, Generator sets, 100, 560-349Q, Feb. 22. Diesel generator sets, 30, 560-350Q, Jan. 24. Grinders, garbage, 91, 522-62Q, Feb. 8.

**Corps of Engineers, Pittsburgh**, Tubing, steel, pipeline section with weld grooved nipple each end, 8.625-in. outside diam by 20 ft long, 223 ea, ENG-36-056-53-172B, Jan. 19.

**Naval Gun Factory, Washington**, Mount, eyepiece and pin assy, 2000 en, 930-3066 ORD B, Jan. 13.

**Signal Corps Supply Agency, Philadelphia**, Rod, ground, 22970 en, 1316-48B, Feb. 6. Shackle, 3500 en, 1316-48B, Feb. 6. Bolt, bent eye, 4500 en, 1416-48B, Feb. 6. Cable assy, 1300 en, 10088-46Q, Feb. 6. Lead, elec, 230 en, 10088-46Q, Feb. 6. Meter, modulation, 450 en, 12518-36Q, Feb. 1.

**Frankford Arsenal, Philadelphia**, Armature, 750 en, ORD-53-SP-X-224, Jan. 10. Bodies, proof projectile 105 MM, 1930 en, ORD-53-416, Jan. 20.

**Corps of Engineers, Seattle, Washington**, Gantry crane, draft tube, 18 ton, 1 ea, CIVENG-45-108-53-45B, Mar. 4. Unit substation, 3 ea, CIVENG-45-108-53-4B, Mar. 10. Turbine, hydraulic, 3500 HP, 2 ea, CIVENG-45-108-53-47B, Feb. 26.

**Ordnance Tank Automotive Center, Detroit**, Cylinder breaker, booster assy, 1000, 53-848B, Jan. 30. Cylinder air brake wheel, 500, 53-856B, Jan. 30. Chamber air brake assy, 65, 53-868B, Jan. 30.

**San Francisco Chemical Procurement District, Oakland, Calif.**, Crankshaft, 20453, 1250, 04-205-53-6B, Jan. 23. Bearing liner, RS 602, 2200, 04-205-53-6B, Jan. 23.

**Naval Supply Depot, Mechanicsburg, Pa.**, Door, water tight, 160, 73-28006, Jan. 29.

**Rock Island Arsenal, Rock Island, Ill.**, Wrench tube and cap assy, 100 ea, 11-070-53-421B, Jan. 22.

**Springfield Armory, Springfield, Mass.**, Check, recoil, M1, 11000 ea, 53-148B, Jan. 23.

**General Services Administration, Washington**, Miscellaneous tools, var., C-RR-785-1, Jan. 18.

**General Services Administration, Chicago**, Water coolers, 564, CHN-355, Jan. 20.

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PAGE  
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## Industrial Briefs

**Electronics Service** — FARMERS ENGINEERING & MFG. CO., has completed a new plant at Irwin, Pa., for production of products for electronic communication and control.

**Vote of Thanks** — MESTA MACHINE CO., Pittsburgh, made its fifth annual distribution recently of service awards to those men and women who have served the company for from 10 to 50 years.

**Change of Plans** — WESTINGHOUSE ELECTRIC CORP. and The Navy Dept. have a change in the production planning of the new Westinghouse-owned plant now under construction at Columbus, Ohio. Recent changes in jet engine requirements will permit the entire plant to go into production of civilian goods.

**On the Way** — INGALLS SHIPBUILDING CORP., Birmingham, has delivered the largest cargo ship ever built on the Gulf Coast, The Lone Star Mariner. The ship displaces 18,000 tons and carries 12,000 tons of cargo.

**Acquired** — THE COLORADO FUEL & IRON CORP., has completed acquisition of the plants, inventories and business of John A. Roebling's Sons Co., Trenton, N. J., which will be operated by John A. Roebling's Sons Corp., a newly-formed and wholly-owned subsidiary of Colorado Fuel & Iron.

**New Service** — MINNEAPOLIS-HONEYWELL REGULATOR CO.'s Micro Div. has established a new engineering service and sales office in Rochester, N. Y.

**Tool Sales** — GENERAL ELECTRIC CO.'s Carboly Dept., Detroit, has appointed Dayton Supply & Tool Co. a distributor.

**SAE Leader** — SOCIETY OF AUTOMOTIVE ENGINEERS, INC. has elected Robert Cass, assistant to the president, White Motor Co., Cleveland, its president for 1953.

**Top this One** — AMERICAN CAN CO., is holding the largest sales seminar in the history of the company in New York for salesmen from its 34 district sales offices in the U. S. and Canada. The seminar is in the form of a series of meetings extending over 6 months.

**Plan to Merge** — HARRISBURG STEEL CORP.'s board of directors voted to approve a merger with Heekett Engineering, Inc., at a special meeting recently in Harrisburg, Pa.; subject to ratification by the stockholders of the corporation at a special meeting scheduled for March.

**Inter Sanctum** — WALTER KIDDE NUCLEAR LABORATORIES, INC., Garden City, L. I. held an "Open House" last week to mark official opening of their new atomic research building at 975 Stewart Ave.

**New Chief** — INSTITUTE OF SCRAP IRON & STEEL, INC., has elected Simon I. Edinburg, district manager, Luria Steel & Trading Corp., Boston, president for the Northern New England Chapter.

**Gets Plant Contract** — LURIA ENGINEERING CO., Bethlehem, Pa., has been awarded a contract by The Quaker State Metals Co., to erect a new factory on Route 72, Lancaster, Pa.

**Sales Outlet** — THE PARKER APPLIANCE CO., Cleveland, has appointed the Standard Brass & Mfg. Co., Shreveport, La., its distributor.

**Deep Freeze** — ADMIRAL CORP.'s recently enlarged Midwest Mfg. Corp. subsidiary, produced its first home freezers last week in Galesburg, Ill.

**Canadian Home** — VANADIUM ALLOYS STEEL CO., Latrobe, Pa., has formed Vanadium Alloys Steel Canada, Ltd., with a plant at London, Ont., and sales office at 132 Brandon Ave., Toronto.

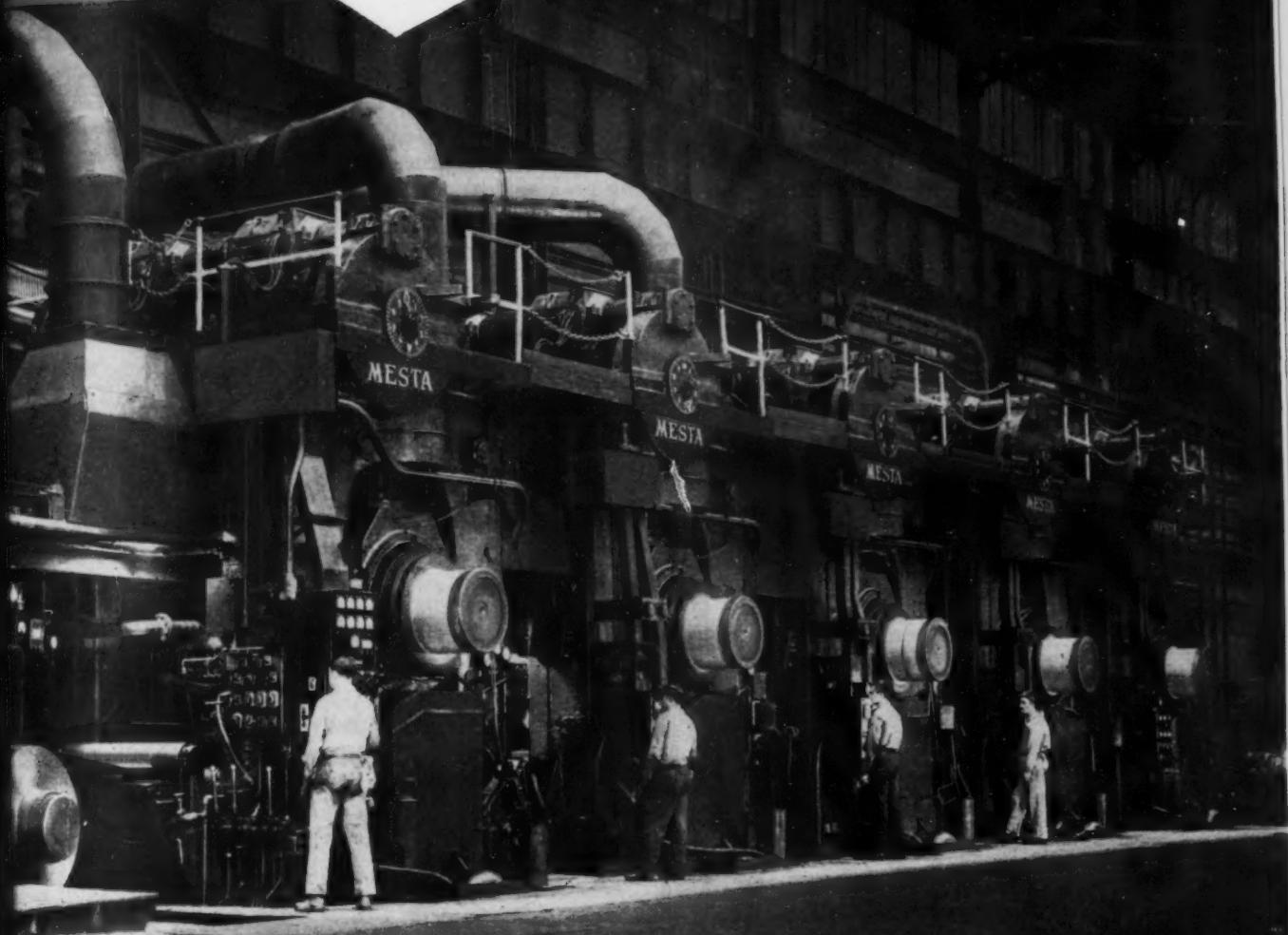
**Testing Service** — KENNETH TATOR ASSOCIATES, Coraopolis, Pa., has established a custom corrosion testing service for industrial environments.

**Bigger Quarters** — STEEL CITY TESTING MACHINES, INC., has moved from 8843 Livernois Ave., to a new and more extensive plant located at 8817 Lyndon Ave., Detroit.

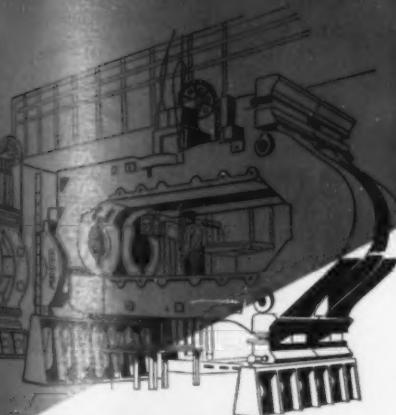
**New Subsidiary** — MAYSTEEL PRODUCTS, INC., Milwaukee, has organized a subsidiary to be known as Gleason Reel Corp., for the manufacture and distribution of Gleason Industrial Reels.

# MESTA

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# The Automotive Assembly Line

## GM Showing Plastic Sport Cars

**Four divisions to exhibit fiberglass convertibles at "Motorama" . . . Plastic cuts tooling costs but serves best only on short runs . . . Other advances on display—By R. D. Raddant.**

Probably the biggest news at the forthcoming General Motors Waldorf-Astoria extravaganza will be the showing of four new fiberglass sports convertibles. Each of the new cars will repre-

cates that all angles are being taken seriously.

Buick, which will show a fiberglass convertible called the Wildcat, explains this type of construction may bring greater versatility

An example that will be noted on the Wildcat is the "roto-static" front wheel discs which remain stationary while the wheels revolve about them.

This roto-static wheel is not just for show, but probably points to air cooled brakes. Brake heat dissipation is a problem that has multiplied with heavier cars and complications of current wheel construction.

These roto-discs have large built-in air scoops that direct cooling air over the brakes. In other words, the wheels provide for an air cooling system that is impossible on conventional wheel design.

Motorama, the name applied to the Waldorf Show, will primarily show the 1953 GM automotive line. However, a strong accent will be placed on experimental and engineering developments. Fisher Body, Research Laboratories, Rochester Products, Detroit Transmission, Delco Radio, Saginaw Steering Gear, Electro-Motive, Cleveland Diesel Engine, Detroit Diesel Engine, Frigidaire, GMC Coach and Truck and Hyatt Bearing divisions will all have exhibits. The Engineering Staff will have four special exhibits, each demonstrating special testing equipment used at GM.

sent a division and each will have its own special features.

The cars are so new that the paint will be scarcely dry on some of them. A week before the show's opening date, Jan. 17, some of them were still in the paint shop. Final decisions on the romantic or descriptive names attached to each had not all been made.

While fiberglass bodies are not exactly new in the show car and experimental fields, the fact that GM is showing four from different divisions indicates that they are being taken seriously.

**Cheaper Tooling** — It is pretty well concluded that fiberglass construction requires too much time for the high production rates of most automobile lines. If it is to find a home in the automotive world, it will be in small run production where speed is not necessary. Its advantage there is in cutting tooling costs, the big handicap is short run production. Plastic dies are generally believed to furnish the best answer to this problem, but GM's interest indi-

in automobile styling.

"This car was designed and built to test the possibility of using fiberglass in automobile bodies," said Ivan L. Wiles, Buick general manager. "Since fiberglass is molded instead of stamped, eliminating the necessity of expensive dies, its use may lead to greater versatility of styling in sports cars which are produced in low volume."

It's hardly necessary to point out that GM executives don't talk publicly about new developments unless more than brief interest is to be shown. Of the five automotive divisions, only Pontiac will not have a car of fiberglass construction. Pontiac will, however, have a special car to show with the other divisions.

**Engineering Features** — These cars may seem too far advanced to the casual observer to serve any practical purpose. However, almost every feature has some practical significance or points to a problem that the automotive industry is trying to solve.

**Wait New Studebaker** — The new model season has just about run its course with the introduction this week of Nash 1953 models. General Motors divisions finished up their showings last week with Cadillac, Buick, and Oldsmobile, and Chevrolet.

Only remaining auto producer that still hasn't displayed 1953 wares is Studebaker. This independent is supposed to be working on something special.

Nash continues its styling trend advanced by Pinin Farini, the custom designer from Turin, Italy. The Statesman will be powered by a new "Powerflyte" engine and a new optional LeMans Dual Jet-

fire engine is offered in the Ambassador. A new hardtop styling, the Country Club, has been added to the Nash line.

The big advance made by Buick is the new high compression, valve-in-head V-8 engine, one of the few completely new engines to be introduced this year. The new engine has a compression ratio of 8.5 to 1, the highest in the industry. It develops 188 hp in the Roadmaster and 170 hp in the Super.

Buick reduced the wheelbase of all Roadmaster models  $4\frac{1}{4}$  in. This reduction provides a shorter turning radius, but the introduction of the shorter V-8 engine permitted the shortening without sacrificing interior space.

The Buick Dynaflow has been improved with a twin turbine to give it a more solid acceleration.

Cadillac took over the lead in the hp race with a boosted engine that generates 210 hp. All three of GM's bigger cars, Cadillac, Buick, and Oldsmobile have replaced the 6-v electrical system with a 12-v system.

### Lincoln-Mercury Now Settled

The Lincoln-Mercury Div., which spent a large part of 1952 in transit, is now permanently located in its new Wayne plant where more than 300 Lincoln and Mercury cars are being turned out daily.

Probably no other automotive division went through the changes in product, organization and production facilities in one year than did this division, now headed by Benson Ford.

In spite of the complexities of moving and reorganization, 31,988 Lincolns were turned out during the year, one of the few cars to show an increase in 1952 over 1951.

Opening of the Wayne plant gives Lincoln-Mercury four new assembly plants, all erected since 1948. Combined, they have a capacity of nearly 500,000 cars a year.

### TRUCKS:

#### Economy keynotes truck building . . . Output and sales race shaping up.

An official of a major truck company recently pointed out the big difference in philosophy between truck and passenger car makers.

A passenger car manufacturer is constantly looking for an excuse to hang a new development on its product. The truck manufacturer to a certain extent fights change. While research is just as prominent in the trucking field, no change is ever contemplated unless it has economic value.

While passenger carmakers are forever adding new equipment, truck makers are on the alert to reduce gadgets because every ounce of equipment cuts into the truck's payload. Economics in truck construction comes first.

Against this limiting background, truck manufacturers are having a production and sales race that in intensity rivals that of the highly publicized passenger

car derby. In 1953 they will be fighting for shares of a probable market of 1,150,000 trucks.

Chevrolet was the leader in 1952, followed in order by Ford, Dodge, International, and GMC Coach and Truck.

About a month ago, Ford announced that automatic transmissions will be available on several models of light trucks. This week GMC, which originated the trend to automatic transmissions in trucks, introduced its new line of light trucks, all of which had Hydra-Matic drive available.

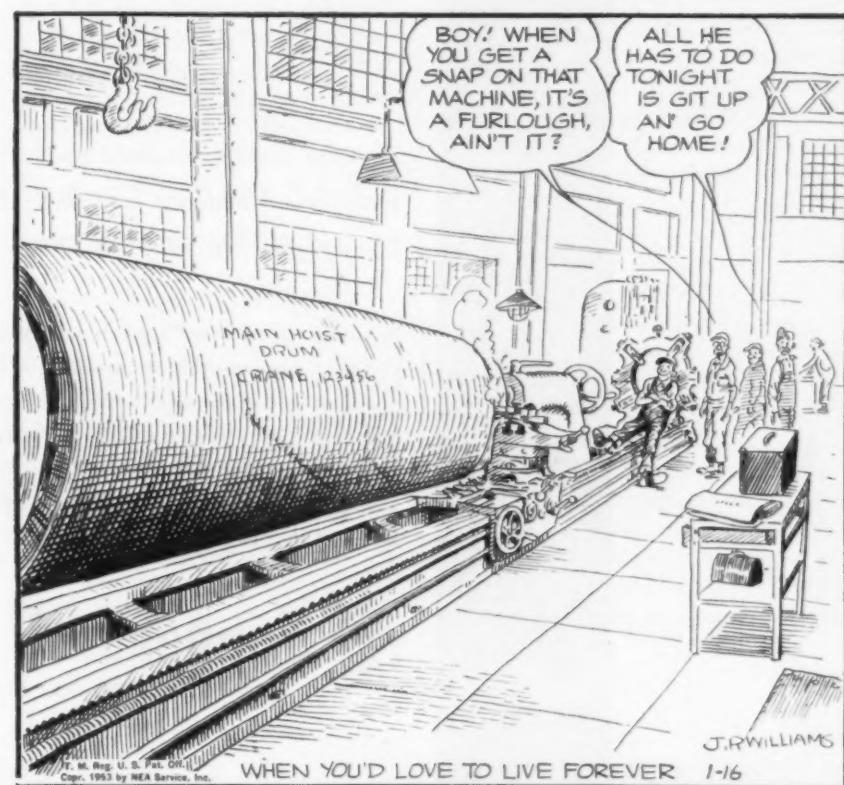
GMC also has two new engines in the gasoline field, one a six-cylinder model that has a compression ratio of 8 to 1.

### Conversion May Last Till Summer

At least two of the Big Three have booked conversion steel through the entire second quarter of 1953. The third will probably be forced to fall in line. Unless auto buying falls far behind expectations, conversion will probably extend into the third quarter.

### THE BULL OF THE WOODS

By J. R. Williams



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## This Week in Washington

### Will Controls End Stimulate Business?

**Republican leadership believes long-term stimulant would offset short-term risk . . . Justice Dept. may help business save time and money on court suits—By G. H. Baker.**

Republican leadership in Congress now believes scrapping of price-wage controls is a calculated political risk which must be taken. Key members of the majority are keenly aware that such a move will inevitably be followed by criticism and jeering rebukes from elements of the Democratic party.

Conclusion has now been reached that long-range benefits to business and consumers alike far outweigh any momentary political gain that could result from an extension of controls beyond Apr. 30.

**Stimulate Business** — It is believed that some prices and some wages will rise slightly after the lid comes off. This is regarded as a natural economic development that can't be helped. But the resulting stimulus to greater production eventually will bring prices down, it is pointed out in Republican huddles. And business will be relieved of the extra overhead costs it has been forced to incur in connection with maintaining price and wage records and petitioning Washington agencies for revised price and wage scales.

Unless some new act of communist aggression forces the U. S. economy to adopt all-out defense measures between now and May 1, price and wage controls are to die an unlamented death. Some form of rent control probably will be renewed. Controls over materials, now on the books until July 1, probably will be extended in limited form.

**Cheaper Answers** — Outlook for some much-needed clarification of antitrust laws still is bright, despite Capitol Hill opposition.

Just what the new Congress and Herbert Brownell—who is to be Attorney General in Ike's Cabinet—have in mind in the way of "clarification" has yet to be made known.

But one kind of "clarification" now under discussion seems to have a good chance of adoption by the Justice Dept. as a standard operating practice. It means the establishment of a "conference section" in the Justice Dept. where business could seek and obtain guidance in advance of—and perhaps in place of—costly litigation.

It is interesting to note in this respect that Secretary of Commerce Charles Sawyer believes that at least 90 pct of all antitrust cases could be solved by preliminary conference.

**Justice Should Help** — Such a step might appear to be acceptable to both government and industry lawyers. This is not the case, however. Rep. Emanuel Celler, D., N. Y., says he regards this and

other recent recommendations of the Commerce Dept. Business Advisory Council as "nothing more than another effort on the part of segments of big business to avoid the full impact of our antitrust laws." Setting up of an advisory office is unnecessary, he believes, adding sarcastically that some BAC members "should by now be well apprised" of the scope and effect of the antitrust laws because of "past experiences with prosecutions."

Feeling among Brownell's aides, however, is that the Justice Dept. has an obligation to assist business by advising it, rather than by harassing it.

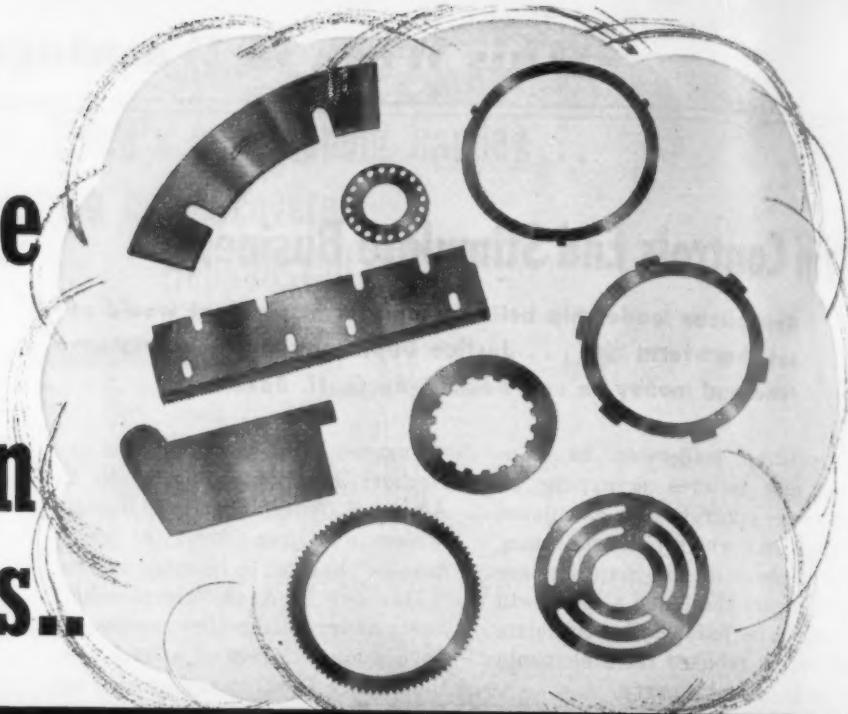
**Industry-Wide Bargaining**— Moves to head off any congressional attempts to ban industry-wide bargaining are gaining momentum at the Capitol. Sponsors of these moves are aware that there's a strong possibility that the Taft-Hartley law will be thrown open for amendment this year. And they are grimly determined to block any move calculated to "strengthen the law" (as pro-management members see it) or "make Taft-Hartley more onerous to labor" (as pro-union members view it).

Taft-Hartley repeal advocates are pointing to a new Library of Congress study (prepared for the Senate Labor Committee) which maintains that any prohibition on industry-wide bargaining would not necessarily reduce the danger of national emergency strikes. Furthermore, small employers and weak locals could be harmed by such a move, it is maintained. Pointing out that only the coal and rail industries would be affected by such a ban, the report predicts that small employers would find themselves at a disadvantage in dealing with strong national unions.

Senator Robert A. Taft, R., O., says he does not now favor any such prohibition. But he predicts that Congress may be forced into enacting "something like that"



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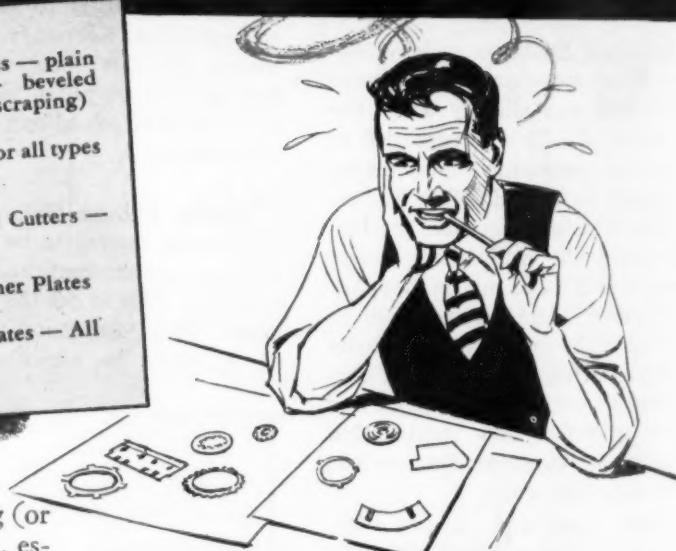
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## DEFENSE: Offer Long Range Plan

**Project East River proposes protection plan from A-bomb, germ attacks . . . Advocates dispersion . . . Strong air defense vital . . . Civilian defense underscored—By R. M. Stroupe.**

Latest non-Washington recommendation that National Security Resources Board continue to push for fewer bombing targets in urban areas comes from participants in Project East River. This group of scientists, educators, businessmen, and government officials has proposed, in a report which is still partially classified as top secret, a plan for protecting the nation from disabling A-bomb and germ warfare.

A basic step in this formula is reduction of target vulnerability in industrial and big-city areas. Another is establishment of an air defense so strong that a saturation raid would be impossible and a crippling assault unlikely. The third is building a permanent civil defense system which can minimize loss of life and wrecking of property.

This will require the best in civilian-military cooperation. Copies of the Project East River report have been sent to the Defense Secretary and the heads of Federal Civil Defense Administration (FCDA) and NSRB.

Heading the project was Otto L. Nelson, Jr., vice-president of New York Life Insurance Co. The group he led was assembled by Associated Universities, Inc.

**Long Range Plan**—A letter of transmittal signed by Mr. Nelson notes that in general the group took the "long-range point of view on civil defense." The letter emphasized that the plan did not offer a guide to be used in gearing permanent measures to those "short-term and expedient policies" now in effect.

Project members outlined the danger, as they saw it, of failing to appreciate the danger potential involved in present-day warfare. Destruction equal to all the bombs

dropped by the U. S. and Britain in World War II, they said, now can be carried in 100 A-bomb-carrying planes.

Of greater danger, the report asserts, is a fatalistic attitude breeding inaction, rather than efforts to organize 156 million people to resist and parry aggression.

"Project East River is convinced," its writers said, "that civil defense can be made manageable in the broadest sense. If, however, it is regarded as merely a 'pick-up-the-pieces' operation, it is doomed to abysmal failure."

Project members called attention to the uselessness of trying to apply a strict civil defense formula to all areas or to all communities within a single area. Large cities with heavy concentrations of industry are acknowledged as inviting air-raid objectives. Rural sections where crops and livestock are grown could have their own wartime problems if germ warfare were used.

Priorities by which civil defense plans are organized should be given on the basis of compara-

tive vulnerability. To make urban areas safer for the industrial firms that must turn out war weapons, Project East River asks for a "positive policy of dispersion, or spacing of new developments in line with standards of relative security from weapons effects."

### Propose Defense Agency Changes

Industry, engineering, and general business experts could contribute more to logistical operations in the Defense Dept. If the Munitions Board were scrapped and its chairman replaced by an assistant Defense Secretary.

Subsequently, the Defense Secretary himself could be directed by statute to appoint a "Munitions Advisory Board," composed of men with years of experience in scheduling production, procurement, and distribution of goods.

These are some of the views expressed by outgoing Defense Secretary Robert A. Lovett in an informal message to President Truman.

As constituted, the official charged, Munitions Board has a "built-in rigidity" which would preclude its ability "to perform adequately in time of war the various functions presently assigned to it by statute." Three of the group's four members, he said, are Armed Forces representatives who must judge their own requests for allocations of production and supply.

**Other Faults**—Congressional action would permit reorganization of both the Munitions Board and Research and Development Board, which have "similar ills," Lovett stated.

His letter to the White House also recommended that:

1. The Joint Chiefs of Staff be permitted to function as formulators and reviewers of war plans, and not as a "clearing house for papers" presented by the Defense Secretary.

2. Composition of the Army Technical Services be examined with a view to elimination of functional overlap.



"I wonder what Chester is engineering now?"

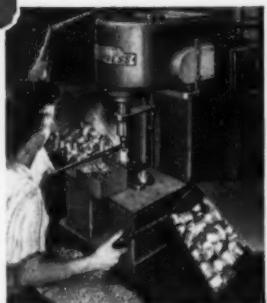
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## West Coast Report

### Another Major Power Cut in Offing?

**Dimmed out Pacific Northwest may be slugged by yet another power cut... It may hit suddenly... New aluminum plant puts more load on power... Costs are running up—By T. M. Rohan**

Officials refuse to be quoted but there's a third major power cut in the offing for the dimmed-out Pacific Northwest and it probably won't be the last.

Rain has finally started in the western part of Washington but snowfall in the mountains and rain in the East are light and hold little promise for the hydro generators.

And the power cut will probably come without the traditional 3-week notice because steam plants built for only a few hours daily supplementary operation are going 24 hours under overload conditions and a breakdown is possible. A heavy freeze in the mountains could also cause quick power cutbacks. Bonneville power officials have put off cuts as long as possible but at the risk of a cut up to 30 pct in the spring.

Principal sufferer is, of course, the aluminum industry now losing about 250 tons daily in the Northwest. But an additional cut would bite deeply into industries which so far have been able to keep under the wire by turning off lights, eliminating overtime, and cutting other marginal consumption.

**Higher Cost**—Costs of remaining power are going up. Puget Sound Power & Light Co. last week was given permission by the State Public Service Commission to raise rates 11 pct.

It asked for 22 pct because of extra cost of steam generated power (four to six times higher) which will run \$1.8 million extra if low water conditions continue through April. Public utility rates will not change as they have first claim on federal power while private utilities must fend for themselves.

**Harvey Writeoff** — And to the consternation of power-starved industries, Harvey Machine Co., of Torrance, Calif. got a tax writeoff for its proposed \$65.2 million aluminum plant and facilities at The Dalles, Ore.

The plant, to be rated 54,000 annual tons and scheduled for 1954 operation, will take 40,000 kw firm power, 20,000 kw "junior firm" and 60,000 kw interruptible from Bonneville. Most will come from McNary dam in 1954 and The Dalles Dam now under construction and to be rated 156,000 kw initial ca-

pacity in November, 1957, and ultimately 1,092,000 kw in 1957.

DPA officials originally wanted the Harvey plant to go into Ohio and offered to build a steam plant there for it but Harvey wanted to keep its operations in the west.

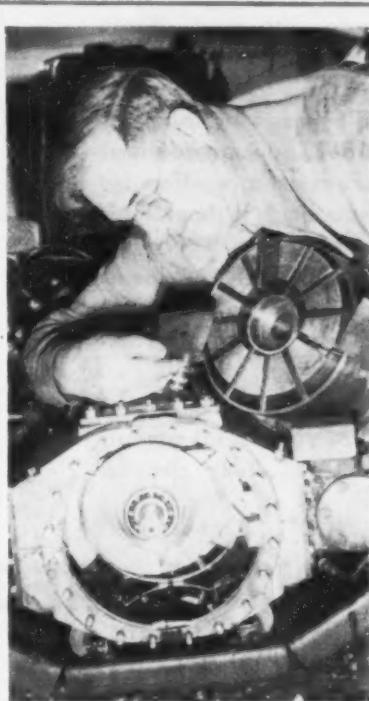
**In Mothballs** — Cutback of tank and automotive defense items will close the government foundry at Pittsburg, Calif. Just as a major rehabilitation program was completed. Originally scheduled for production of armor castings, the two 25-ton openhearts will continue to be used by neighboring U. S. Steel, Columbia-Geneva, Div., which is doing the modernization and will absorb most workers.

**Kaiser Output** — Kaiser Steel production figures for 1952 which topped 1951 by 5 pct in ingots were released last week in an unusual report.

The report listed 1,384,060 net ingot tons; 977,267 tons pig iron (as hot metal); and 964,302 tons finished products—all new record annual figures. Two blast furnaces rated 1200 tons of pig each daily averaged 1484 and 1456 during December. Coke consumption was low—1338 and 1351 lbs per ton respectively. Total employes are 8000 with \$33 million annual payroll.

**British Competition** — English firms which have been scoring occasionally on electric equipment bids won another one last week. The Corps of Engineers at Seattle announced the English Electric Export and Trading Co. was low bidder at \$4.4 million for four 64,000-kw hydraulic generators for the Chief Joseph Dam at Bridgeport, Wash. U. S. bidders who lost out were Westinghouse at \$4.9 million, General Electric at \$5.28 million, Allis-Chalmers at \$5.29 million and Elliott Co. at \$5.3 million.

Westinghouse got the first group last May for the Chief Joseph Dam which will rank second only to Grand Coulee in output.



**HOME MADE:** J. F. Carner, of Long Beach, Calif., has installed a vane-type hydraulic drive of his own design in his car. Rotor unit in rear assembly has been removed, leaving forward unit in case. The shifting yoke in the case, controlled by outside lever, controls shifting of vane assembly from one side to other.

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With greater accuracy, higher production and lower cost per cut, comes the extra dividend of Safety, for MARVEL High-Speed-Edge Hack Saw Blades are Positively Unbreakable—they will not shatter.

Ask your local MARVEL distributor (see classified phone book) to help you modernize your metal sawing with Marvel High-Speed-Edge Blades. They cost no more than ordinary blades.

1. High-Speed-Steel cutting edge.

2. Tough unbreakable alloy steel body with hardened eyes.

1 & 2. Integrally welded to make a fast-cutting, long lasting composite blade that is *positively unbreakable*.

## ARMSTRONG-BLUM MFG. COMPANY

"THE HACK SAW PEOPLE"

5700 BLOOMINGDALE AVENUE

CHICAGO 39, ILLINOIS



## Machine Tool High Spots

### Plastic Dies Key to New Auto Era

New, varied car designs, plastic bodies await lengthening of plastic die runs . . . High tooling costs increase interest in plastic method . . . Used for hood tops—By E. C. Beaudet.

Interest in plastic dies is becoming increasingly active among automotive manufacturers. Although the most practical application to date has been to use them in short run dies, continuing efforts to increase the length of run may result in greater use.

Automotive interest has been partly sparked by the experience

For the long-awaited Vance Committee report see p. 48

of aircraft manufacturers. Some have had excellent results in drawing aluminum material tougher than steels now used in auto plants. This has been achieved in medium length runs which gives hope that die life may someday be extended to serve a mass production operation.

**Mass Production**—Plastic dies have several advantages, which, if present short run limitations are overcome, will assure them a prominent place in mass output. There are practically no size limitations on the dies that can be made, and since they are composed of almost non-shrinkable material little machining is required before the dies are ready for use. Steel inserts and draw rings can be used in plastic dies to resist wear.

Repairs on plastic dies can be made quickly with a minimum of expense. Dies damaged through spalling can be repaired by cutting out damaged areas and adding plastic resin to build them up again. Drawing of stainless steels is also made considerably easier when plastic dies are used.

**Cut Tooling Time**—Greatest advantage of plastic dies is the time they save for manufacturers getting into production with new

sheet steel designs. It is estimated that in some cases tooling time for a sheet metal part can be reduced from 20 weeks to less than 1 week with plastic dies.

Present high tooling costs are, of course, mainly responsible for the interest being shown. One automobile manufacturer is now trying to substitute plastic dies for hard iron dies used in making hood tops. Should this experiment prove successful other auto makers may try it.

**New Designs**—If plastic dies are eventually made practical on long production runs several interesting auto production changes may result. Car designs would be less standardized, and, with tooling time cut down from months to weeks, there would be less chance for new design features to become known before production takes place. Lower overall cost of the die might result in use of standby dies which could be put into produc-

tion immediately if a breakdown occurred.

Proven ability of plastic dies might also mean an upswing in the number of plastic automobile bodies produced. Plastic bodies are now being made but are restricted to special models and sports cars. This week General Motors unveiled a sports car with plastic body at a showing in New York. Other firms making them for sports car use are Kaiser-Fraser and Nash.

One disadvantage of plastic dies, aside from the major one of short life, is that the material is not reusable. This is important because the cost per lb is around 50 cents per lb.

**Critical Tools**—National Machine Tool Builders' Assn. is making an effort to determine if certain machine tools now on the government's critical list can be dropped due to greater availability of these machines. Results will then be made known to National Production Authority for further action.

Just how many or what types of tools will be removed from the rated classification is difficult to tell. However, it is known that certain builder's have enough capacity to more than meet government orders on their books.

**Set Orders**—Some machine tool builders look askance at reports of great increases in orders for the jet engine program. They are of the opinion that some of the new contracts released for end items will be at the expense of others which have been cancelled out.

From various requests for engineering changes of tools already on the order books they feel these machines are being adapted to meet the requirements of these new contracts. With some contracts being cancelled out and design changes being requested they don't feel that a considerable overall increase in orders will take place.



# Whether the job is BIG or small uniform *Carpenter* tubing speeds fabrication



The giant on the left and the pygmy on the right are both heaters—both are made from Carpenter Stainless Tubing—and the manufacturers selected Carpenter for essentially the same reasons.

Whether the job calls for a large immersion heater for heating chemicals in batch tanks or a small heating unit for a soldering iron, these fabricators know that the consistent uniformity in analysis, tolerance and finish of Carpenter tubing makes their production move smoothly and gives them the finest possible finished product.

When you want to discuss your design or fabricating problems, call your nearby Carpenter Stainless Tubing Distributor. He will be glad to put his experience to work for you. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y. "CARSTEELCO"

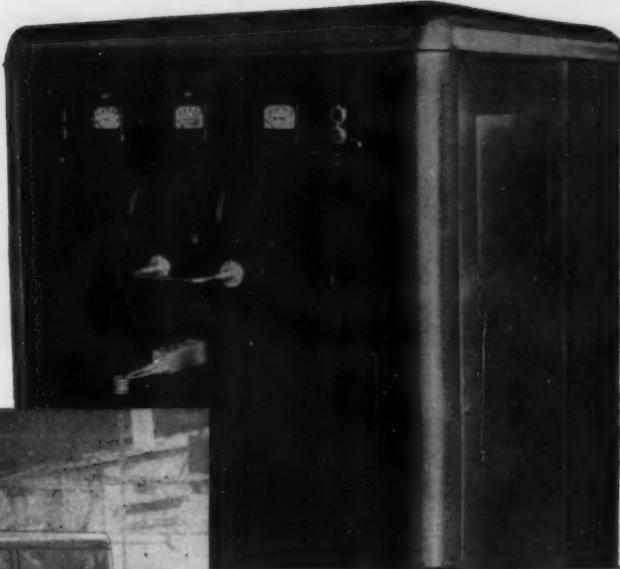
# Carpenter

## STAINLESS TUBING & PIPE



- guaranteed on every shipment

# AT WENDT-SONIS A LINDBERG INDUCTION HEATING UNIT



## ups tool tip brazing 135% . . . replaces two units

Production brazing of carbide tip tools has soared from 270 to more than 600 an hour since Wendt-Sonis, Hannibal, Mo., tool manufacturer, installed a Lindberg induction heating unit.

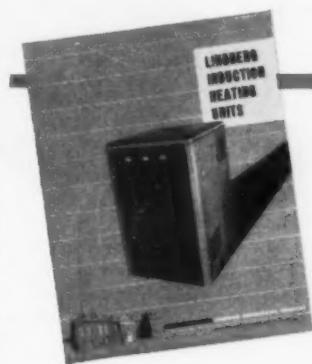
Two operators, fluxing parts and putting brazing metal and carbide tool tips in place, load the assemblies on a conveyor belt that passes a continuous stream of work through a specially designed, long hair-pin type heating coil.

Production is speeded because 14 tool assemblies . . . not just one . . . are in the heating field at any given time. The first tool on the conveyor passes from the heating area, leaving 13 others still in the field of heat, with tool number 15 just entering the coil area.

Production, formerly through two smaller units, totalled only 135 tools per hour, per unit, and required four operators. Thus the

new equipment frees two operators for other important work.

If your requirements call for production brazing, soldering, hardening, annealing, stress relieving, hot forming, forging or shrink fitting, a Lindberg induction heating unit can better your production picture . . . minimize costs . . . increase profits.



Ask for a copy of Bulletin 1440. It pictures and describes standard models . . . illustrates 11 cost reducing features . . . lists applications . . . shows accessory equipment.

# LINDBERG



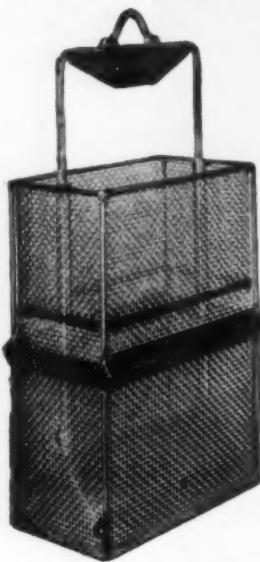
HIGH FREQUENCY DIVISION

Lindberg Engineering Company, 2452 West Hubbard Street, Chicago 12, Illinois

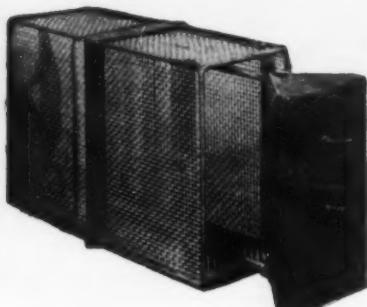
**Free Publications**

*Continued*

**ROLLOCK**  
**FABRICATED ALLOYS**



**DROP-BOTTOM BASKETS**  
*for fast release of load*



Both baskets were fabricated-welded from alloys best suited for the exposures and, like other Rolock products, were job-engineered to suit the specific use. Among the thousands of designs created by Rolock engineers there are many that, with slight changes in shape or size, will fill the requirements of your heat treating plant or department.

To help you solve such problems we offer two excellent catalogs . . . No. B-8 Heat Treating Section and No. B-9 Corrosion Resistant Section. They picture and describe a great variety of designs in Baskets, Crates, Trays, Racks, Fixtures, Screens, Grids, Retorts, Muffles, Tanks, Sinks, Hooks, Chains, etc.

We have put more practical material into these catalogs than you will find in any other similar publications. COPIES ARE AVAILABLE ON REQUEST.

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**ROLLOCK INC. • 1362 KINGS HIGHWAY, FAIRFIELD, CONN.**

**JOB-ENGINEERED** for better work  
 Easier Operation, Lower Cost

SRLB8



Drop-bottom salt pot basket (top) has lifting bars attached to solid sheet bottom. When assembly sets into holder frame over quench tank, bottom drops, releases load.

Above is a heavy duty basket with extra rugged hinged bottom, released instantly by disengaging lever from pin. Note single point suspension.

**Castings**

Case histories concerning instances in which critical material shortages have been overcome by use of Meehanite castings are presented in a new booklet. Also included are alphabetical tabulations listing specific replacements of alloyed irons and steels, brass, bronze, forgings and other items. The types of Meehanite metal used for such applications are also listed. *Meehanite Metal Corp.*

For free copy circle No. 14 on postcard, p. 69.

**Lubrication**

Lubricating problems encountered by industrial plants in stepping up production and ways in which they can be solved are the topics of a new booklet put out by Sun Oil Co. Complete details are given on the company's Sunep, an extreme-pressure lubricant for high-output industrial gearing. The lubricant is also recommended for use with heavily loaded plain bearings and screws. *Sun Oil Co.*

For free copy circle No. 15 on postcard, p. 69.

**Weldments**

Fabricated steel weldments, composite welded assemblies of fabricated steel plate and castings, and cast-welds, assembled entirely of castings, are discussed in a new 6-p. bulletin. Physical advantages of weldments, design principles and economy factors are discussed. *Continental Foundry & Machine Co.*

For free copy circle No. 16 on postcard, p. 69.

**Furnaces**

Roller hearth furnaces are designed for continuous heat treating processes where versatility and low-cost, high-production methods are required. Furnaces of the roller-hearth type can be used in treating various parts such as sheets and plates, bar stock and tubing, in addition to coils and small fabricated parts where trays or pans may be used to hold the material while it is being conveyed. Drever Roller Hearth furnaces, described in a new leaflet, are available in oil, gas or electrically heated models. *Drever Co.*

For free copy circle No. 17 on postcard, p. 69.

the difference  
in cleaning results is

# WHEELABRATOR®

AIRLESS BLAST CLEANING

TIME SLASHED  
IN HALF  
14 MAN HOURS  
SAVED DAILY

Continental Gin Co., Prattville, Alabama has found there is a big difference in cleaning room efficiency using the airless Wheelabrator. Although the tonnage of gray iron castings cleaned daily is relatively small—only 8 tons—the savings effected are worthwhile. They replaced FOUR tumbling mills with ONE 66" Wheelabrator Swing Table



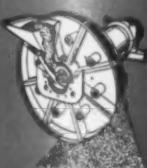
and cut their cleaning time in half.

The speed and versatility of the Swing Table—which will rapidly clean anything which will fit on the work table—enabled a reduction of 58% in labor. All cleaning is accomplished in 5 hours time. With the tumbling mill set-up 24 man hours were needed due to time-consuming sorting, loading and unloading operations.

Mr. J. N. Buckner, Gen'l Supt., says he "would not trade the Wheelabrator for any other method known." It produces a cleaner product, simplifies inspection for surface flaws, improves working conditions and requires less floor space.

Like to know how this profitable difference in cleaning results can be duplicated in your foundry? Wheelabrator engineers will make a thorough survey of your problem recommending the size and type equipment for your application. Such a survey costs you nothing—and may save you a great deal.

*Write or call for details today.*



**WHEELABRATOR** The perfected airless centrifugal blast unit pioneered by American slashes cleaning time and costs. Conerves power, labor, space. Cleaning perfection results in longer tool life, faster machining and grinding, easier inspection.



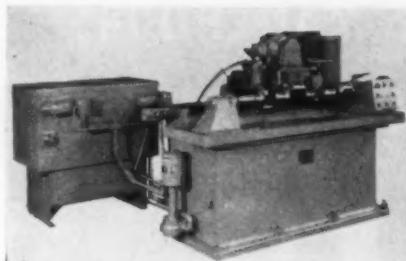
# American

WHEELABRATOR & EQUIPMENT CORP.  
505 S. Byrd St., Mishawaka 2, Indiana

WORLD'S LARGEST BUILDER OF AIRLESS BLAST CLEANING EQUIPMENT

# NEW EQUIPMENT

New and improved production ideas, equipment, services and methods described here offer production economies . . . just fill in and mail the postcard on page 69 or 70.

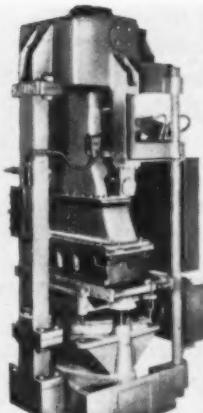


## Machine spotfaces holes in crankshaft cheeks

The MR136 is one of three special machines designed to drill, ream and spotface holes in cheeks of aircraft engine crankshafts. Each machine is a single spindle type with the spindle mounted in a head unit to suit the restricted space requirements encountered in the

workpiece. Spindle head of the MR136 is positioned between crank throws by means of a handwheel and located by plunger in index bushing. Hydraulic feed cycle is controlled at pushbutton station. *Mo-line Tool Co.*

For more data circle No. 18 on postcard, p. 68.

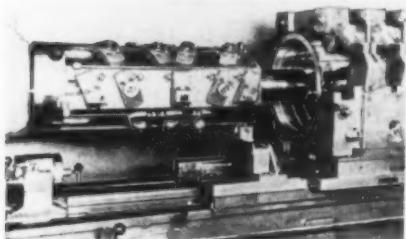


## Core blower operates easily, increases output

Tilt-fill sand chamber is an innovation on the new Sutter core blower. When a core has been blown the chamber tilts backward on anti-friction bearings for refills. When the chamber is filled, it tilts forward again against a positive stop which assures accurate alignment of the sand chamber and the core box. Sand refill is controlled by a timer, adjustable to suit each core. Dome of machine is a reservoir for compressed air. This provides an imme-

diate release of compressed air when blowing a core and also compensates for fluctuations in line pressure. Draw table is raised by a large-diameter squeeze piston under center of the table. Operation is on a ten-second cycle. Core area is 12x34 in. with 15-in. maximum core depth. The machine has a 10-in. draw. Cast iron and steel parts of rugged design are used throughout machine. *Sutter Products Co.*

For more data circle No. 19 on postcard, p. 68.

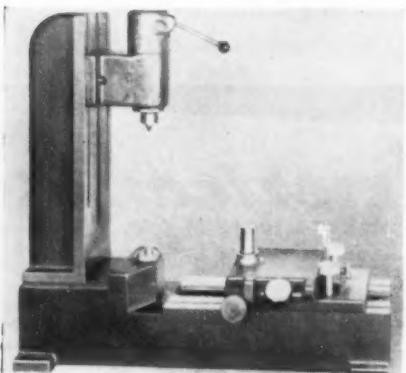


## Completely machines jet engine compressors

A machine built for the complete machining of a jet engine compressor case has been developed by Alfing Kessler Werke of Germany. The design is in two pieces. Boring bar is of rigid design with a temporary support during loading.

Both halves of the housing are clamped in the fixture by a series of self-locking, spring-loaded blocks. Carriage then advances the work over the boring bar. *Morey Machinery Co., Inc.*

For more data circle No. 20 on postcard, p. 68.



## New fixture checks gears with integral shafts

A bench-type rolling fixture checks size, eccentricity and roll smoothness of cluster gears and similar types having integral shafts. A heavy cast iron base, scraped ways and hardened and ground ball ways are features of the fixture. It has a spring-return, lever-controlled retractable upper center. Center distance is adjustable from 2 to 10 in. Maximum distance between centers

on the overarm is 12 in. Gears to be checked are loaded between centers on the overarm. The master gear is brought in to mesh with the gear by an eccentric lever control. Turning the gear manually causes a 0.0005 in. indicator to show variations in size, eccentricity and roll smoothness. *Michigan Tool Co.*

For more data circle No. 21 on postcard, p. 68.

*Turn Page*

# Introducing

## ILLINITE®

### STANDARD CUTTING TOOLS

#### A COMPLETE LINE

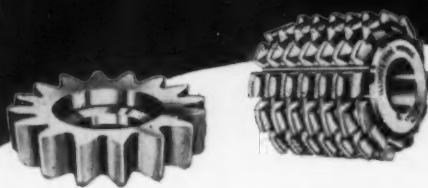
End mills, saws, milling cutters, hobs, shaper cutters and tool bits—all in accordance with latest applicable A.S.A. standards.

#### ENGINEERED FOR PRODUCTION EFFICIENCY

Design features, precision workmanship and top quality materials assure faster cutting, longer life.

#### AVAILABLE THROUGH LEADING DISTRIBUTORS

A nationwide system of stocked distributors assures convenient service, prompt delivery.



### Send for this New Catalog Today!

Developed specially for those who want fast service on standard tools! Complete with dimensional and purchasing data—every tool illustrated—organized for tool buying convenience. Write for yours now!

## ILLINOIS

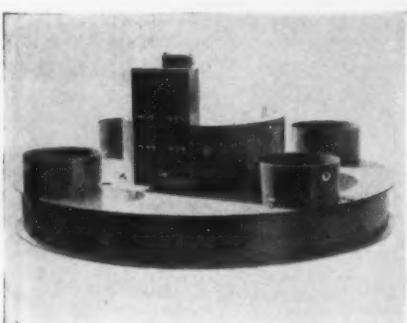
### TOOL WORKS

2501 North Keeler Avenue  
Chicago 39, Illinois



## New Equipment

Continued

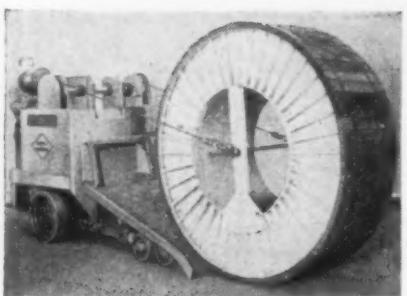


### Turtable machine makes centrifugal castings

This vertical, four spindle semi-automatic centrifugal casting machine makes steel castings. The same type machine can make ferrous and nonferrous centrifugal castings in sand or permanent molds at low cost. The machine automatically indexes 90° and stops. When a particular spindle ap-

proaches the pouring station it automatically comes up to spinning speed. The metal is poured and a button operated to initiate the indexing for the next station. The poured mold continues to spin until the metal has solidified. *Centrifugal Casting Machine Co.*

For more data circle No. 22 on postcard, p. 61.

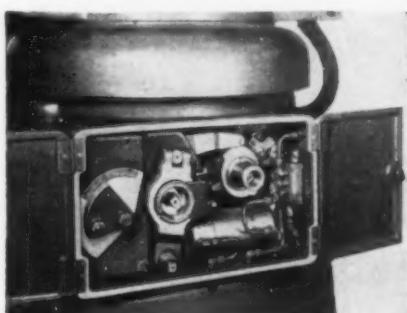


### Platform truck for reel handling

Designed for handling large reels to 96 in. diam and weighing 20,000 lb, this powered platform truck is equipped with a rocking platform and a powered winch. Dual cables connected to the powered winch on the vehicle, are attached to the pin running through the center of the

reel. The winch is used to pull the heavy loads onto the rocking platform of the truck. As the reel strikes a horizontal bar on the battery department, power to the winches is automatically cut off. *Elwell-Parker Electric Co.*

For more data circle No. 23 on postcard, p. 61.

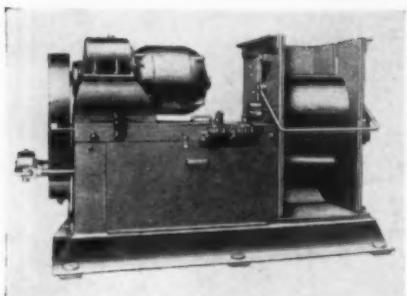


### Scope of diagonal gear shaving extended

A mechanism built into a diagonal gear shaving machine provides automatic precision up-feed in selected increments throughout the shaving cycle and automatic return to the proper backlash position for loading and unloading at the end of the cycle. When shaving diagonally the cycle is no longer limited

to two strokes. It may include several cutting strokes each with its own increment of up-feed and, in addition one or more idling strokes. Cycle time has been decreased due to rapid up-feed in increased cycling speed. *National Broach and Machine Co.*

For more data circle No. 24 on postcard, p. 61.

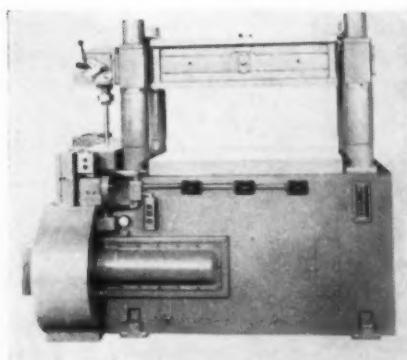


### Bundler handles stringy scrap

For handling scrap of a stringy nature, a new bundler forms scrap into compact cylinders for easy handling, storing, shipping and remelting. It is recommended for bundling steel, aluminum, brass and lead—either in wire or strip form. Model 18 forms a roll 18 in. diam x 18 in. long; Model 24 pro-

duces a roll 24 in. diam x 24 in. long. Cylinders of scrap are formed around a revolving spindle. Power is transmitted to the spindle through sprocket and multiple strand roller chain drive system. Air pressure system discharges scrap. *McLanahan & Stone Corp.*

For more data circle No. 25 on postcard, p. 61.



### Die tryout press operates at 50 strokes a minute

A 100-ton die tryout press has head that can be quickly released and rotated to any point up to 240°, permitting the operator to barter, spot, shear, fit and finish both punch and die without removing die from press. Four post construction assures perfect alignment of both punch and die. Drive mechanism is housed in the base and pulls the

head down. Air clutch is a combination flywheel type, air operated, with multiple disk brake. Electrical controls of clutch permit inching, single stroke, continuous operation and forward or reverse operation. The press has 6-in. stroke. *Alpha Tool Works.*

For more data circle No. 26 on postcard, p. 61.

Turn Page

**MASSEY-HARRIS** maintains the only full-scale test track of its type in the implement industry. The track gives these combines more punishment in hours than normal service does in years.



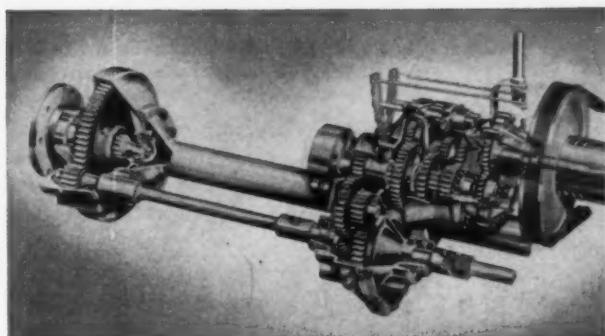
**SUNOCO EMULSIFYING CUTTING OILS** are used in machining many precision parts. Being broached here are cylinder ends which hold the thresher bars. It is their function to maintain the thresher bars in close alignment with the concave bars to provide efficient operation.

## MANY PARTS OF NEW MASSEY-HARRIS COMBINES MACHINED WITH SUN CUTTING OILS

The new Massey-Harris Self-Propelled Combines are precision mechanisms. They are as perfect as a century of experience, modern engineering and production can make them. Sunoco Emulsifying Cutting Oils are used in machining close tolerance parts; Sunicut Cutting Oils are used where an emulsifying oil is not suitable.

"Test it on the track—prove it in the field." That's the Massey-Harris way of insuring the quality of their products. Sun products play an important part in maintaining their high standards.

To learn the right cutting oils and lubricants for your job, consult a Sun representative. You will find his services practical, reliable and complete. Write or call SUN OIL COMPANY, Philadelphia 3, Pa.



**SUN LUBRICANTS** are used in many of these self-propelled combines for gear and crankcase lubrication. Massey-Harris selected these Sun products because they meet their unusually high standards.

**SUN INDUSTRIAL PRODUCTS**

SUN OIL COMPANY, PHILADELPHIA 3, PA. • SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

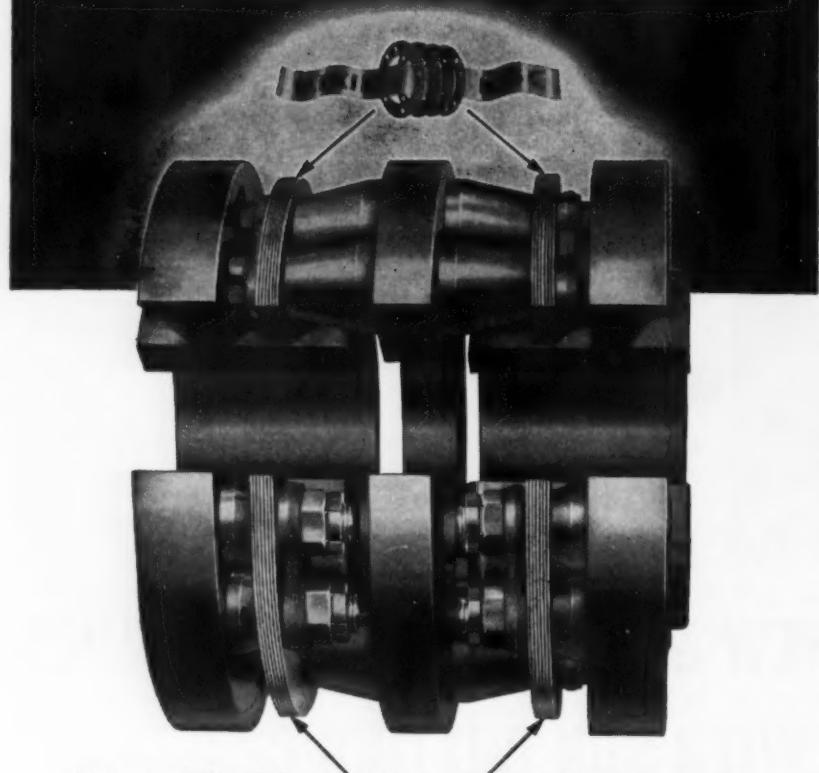


## AVOID COSTLY SHUT-DOWNS!

prolong the life of your machines with Thomas Couplings

### DISTINCTIVE ADVANTAGES of THOMAS ALL-METAL COUPLINGS

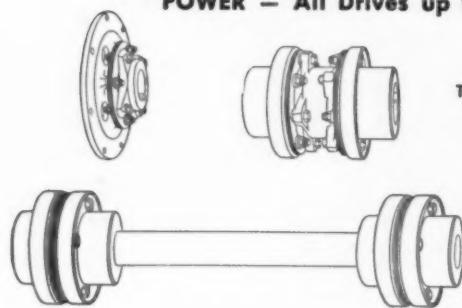
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| GREATEST ECONOMY        | No Maintenance Pays for Itself             |
| NO LUBRICATION          | No Wearing Parts Human Element Eliminated  |
| NO BACKLASH             | All Parts Solidly Bolted No Loose Parts    |
| CAN NOT "CREATE" THRUST | Free End Float under Load and Misalignment |



Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

SPEEDS — All Speeds up to 30,000 RPM.

POWER — All Drives up to 40,000 HP.



THE THOMAS PRINCIPLE GUARANTEES  
PERFECT BALANCE UNDER ALL  
CONDITIONS OF MISALIGNMENT.

MANUFACTURERS OF  
FLEXIBLE COUPLINGS ONLY  
FOR OVER 35 YEARS

Write for our new Engineering Catalog No. 51

**THOMAS FLEXIBLE COUPLING COMPANY**  
WARREN, PENNSYLVANIA, U.S.A.

### New Equipment

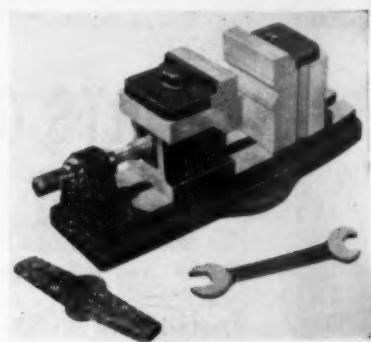
Continued



### Package counter

New package counter is a self-contained unit which can be used either in a line of roller gravity or power conveyer. Two short sections of slat conveyer, a counterweighted roller, and a mechanical counter with a compact steel housing comprise the development. A receiving slat conveyer operates at 80 fpm, discharge end at 100 fpm, providing a gap between packages even if received in steady stream. As the package discharges from the receiving section it depresses the counterweight roller and operates the mechanical counter. Weight of the package itself operates the counter. *Logan Co.*

For more data circle No. 27 on postcard, p. 61.



### Utility vise

A four-in-one vise reduces setup time, eliminates costly jigs. All parts necessary for clamping work securely and accurately are included in this one compact unit. The rear turret revolves presenting four different faces for holding various kinds of work. Auxiliary jaws at the top of each turret spread at an angle to hold odd shaped work. The vise is of heavy, rugged construction, available in two sizes. *Brown Engineering Co.*

For more data circle No. 28 on postcard, p. 63.

Turn Page



**another reason why more  
threading shops say—**

**"we've standardized on**

**VERS-O-TOOL"**



You probably know Vers-o-tools as the self-opening, precision die heads that feature the circular-ground thread type of chaser—

- the kind that give as many as 200 grinds.
- the kind that are micrometer gauge checked on their blocks before and after each grind, so that the first piece cut will be right—no removal of head, no fussing to get size, no scrap.

Vers-o-tools are the most versatile tools, produce more per dollar of investment—cost less. That's why so many experienced users say, "We've standardized."

#### **How about the shorter runs?**

Simply substitute the Adjustable Blade Chasers and Blocks for circulars in the same Vers-o-tool head. They also have ground threads and the cost is less.

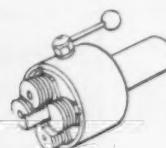
#### **Hollow Milling?**

End forming and turning cutters, both circular and blade-types, cut three times faster than single point tools, snap open and leave no marks, also knurls and burnishing rolls.

#### **Interchangeable?**

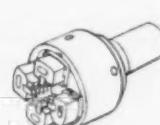
All chasers, mills or rolls, circular or blade-type, are, with their blocks, used in both revolving and non-revolving Vers-o-tools, die size for size.

DT-52 is the complete new catalog on Vers-o-tools  
and Namco Solid and Collapsible Taps.



Style DS Vers-o-tool  
(Non-revolving Type)

10 Sizes,  $\frac{1}{8}$ "— $6\frac{1}{2}$ ".

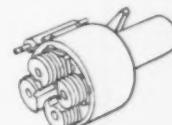


Style DR Vers-o-tool  
(Revolving Type)

13 Sizes  $\frac{1}{8}$ "— $6\frac{1}{2}$ ".

Shown with Adjustable  
Blade Chasers

7 Sizes,  $\frac{1}{8}$ "— $2\frac{1}{2}$ ".



Style DBS Vers-o-tool  
(for B&S Automatics)

3 Sizes,  $\frac{1}{4}$ "— $1\frac{1}{2}$ ".

## **Time Saving ... that's it!**

Change chasers in less than 2 minutes—just lift reset handle, slide back the hood and they drop out—no screws, no adjustments, patented.

Time saving—that's it! . . . And that's one big reason why makers of smooth class 3 high pressure threads whose 'round-the-clock schedules often run into millions of a kind STANDARDIZE on Namco Vers-o-tools.

HOUR DELIVERIES ON MOST STANDARD STOCKABLE NC AND NF CHASERS AND BLOCKS—ALSO NATIONAL TAPER PIPE AND DRY SEAL

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**New Equipment**

*Continued*



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**Paint primer**

New primer for vinyl finishes on rusty steel, covers and adheres to the rust, acting on it slowly to chemically and mechanically bond steel, rust and primer together. Further rusting is stopped in atmospheres that corrode steel at a slow but steady rate. It wets and changes rust but does not dissolve it in the normal sense. Known as Rustbond Primer, it contains a new type of vehicle which gives it high polarity, excellent edge coverage and ability to reduce rust to basic iron. *Carboline Co.*

For more data circle No. 30 on postcard, p. 69.

**Nylon anode bags**

Specially-treated nylon fabric for anode bags and diaphragms increases the life and reduces replacement cost of them. Tests indicate the fabric has greater resistance to chemical action and abrasion than cotton duck; particularly resistant to hot caustic solutions; and does not become salt incrusted. *Hanson-Van Winkle-Munning Co.*

For more data circle No. 31 on postcard, p. 69.  
*Turn Page*



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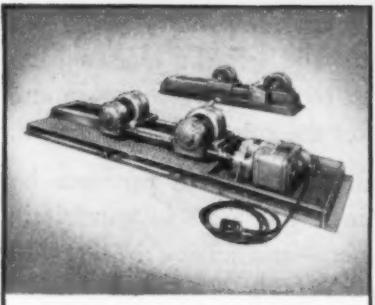
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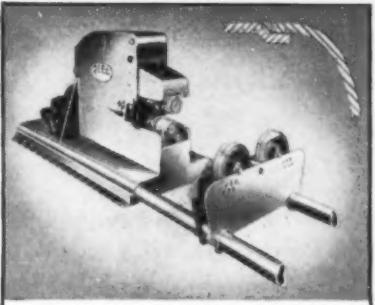
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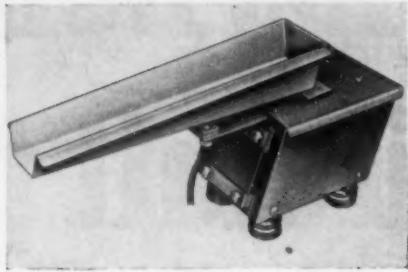
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## New Equipment

Continued



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For more data circle No. 32 on postcard, p. 69.

### Metal cleaner

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For more data circle No. 33 on postcard, p. 69.

### Sub-zero freezers

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For more data circle No. 34 on postcard, p. 69.

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and eliminates Crating Department bottleneck for Hotpoint!



"BEFORE" HOTPOINT RANGE PRODUCTION LINE STALLED. Hotpoint workers found the hand stretcher method (shown above) too awkward in fastening corrugated board for shipping protection to new ranges as they poured off the production line. The line kept backing up.



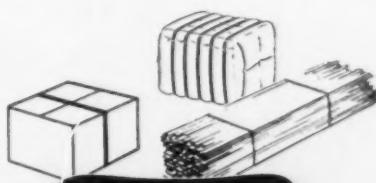
"NOW" ACME STEEL PNEUMATIC STRETCHER ELIMINATES BOTTLENECK, CUTS COSTS! The same workers now tension pre-cut Acme Steel strapping with an Acme Steel pneumatic stretcher. Shipping preparation costs have been held as much as 20 per cent below normal industry shipping costs. One operator says, "A man couldn't last all day before—too hard on the arms. Now with the Acme Steel system it's easy to keep ahead of production."

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There are dozens of cases in the files to prove that nearly everything made to eat, wear, sit on or live in can be assembled and packed swiftly and will arrive safely with Acme Steel strapping. For specific examples, write to Acme Steel Products Division, Dept. IA-13.

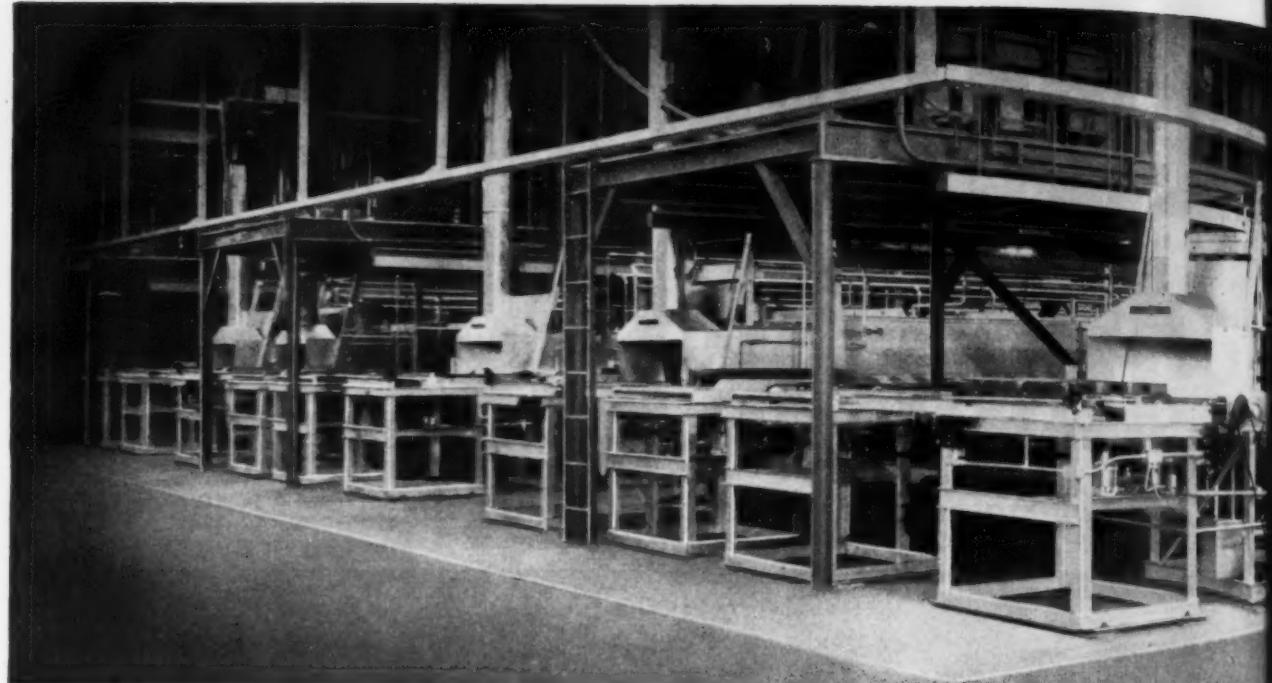


**ACME  
STEEL**

ACME STEEL CO.  
CHICAGO

**ACME STEEL COMPANY**

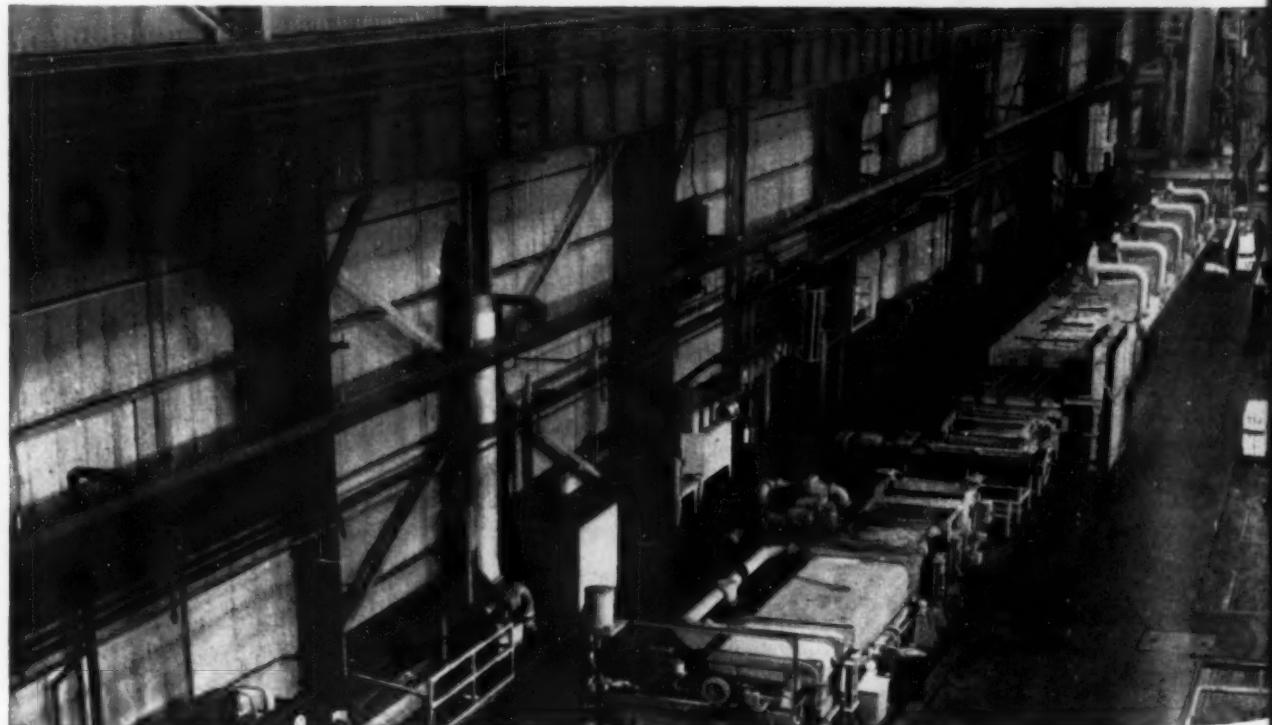
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meet customer's exact requirements for continuous annealing and galvanizing of steel strip. Experienced installation men supervised the complete set-up.

# *The Iron Age*

## SALUTES

*John P. Roche*

This young executive has established an impressive record in industry and civic activities.



JOHN ROCHE recently was elected president of the Pittsburgh Chamber of Commerce. Youngest man ever to hold this job, he was 40 just one day before he took office on Jan. 1.

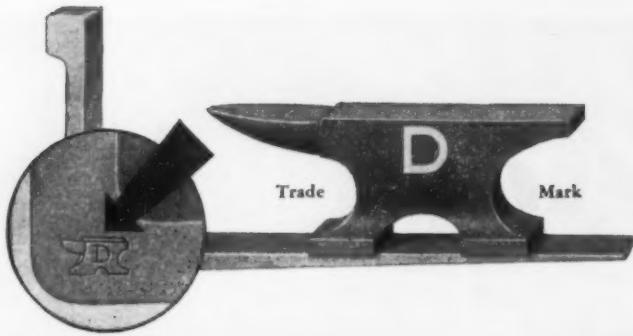
This is typical of the way things have been happening to John Roche since his graduation from University of Pittsburgh law school in 1938. In 1946, when he was 33, he joined Heppenstall Co., steel forgings manufacturer, and was vice-president in charge of sales until his election as executive vice-president in 1951.

In his present job, John is in constant touch with the Air Force in working out knotty details on the heavy press program. His company operates a die block plant for the project at Eddystone, Pa.

John readily admits we have a great deal to learn about operation of giant presses. In some respects we are cutting our eye teeth despite experience with forging presses of less power and size, he points out.

John has always been active in civic affairs. The Pennsylvania State Junior Chamber of Commerce named him "Man of the Year" in 1943. He is a past president of the Pittsburgh Personnel Assn.

Married and father of three girls and a boy, he spends as much time as possible with his family, particularly at his country home at Laughlintown, near Ligonier, Pa. While there, he likes to ski, swim, or toboggan with the kids, depending on the season.



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# The Iron Age

## INTRODUCES

P. Grant Forman, elected president INDUSTRIAL SILICA CORP., Youngstown, and Myron E. Ullman, elected vice-president. Mr. Forman succeeds Jacob S. Coxey, Jr., who has retired because of ill health.

James P. Quam, elected president, RANDALL GRAPHITE BEARINGS, INC., Lima, Ohio.

William C. Hale, Jr., elected vice-president, SOUTH CHESTER CORP., Lester, Pa.

Randolph W. Hyde, appointed assistant vice-president and assistant treasurer, U. S. STEEL CORP., Pittsburgh.

M. F. Meissner, appointed a vice-president and director, OLIN INDUSTRIES, INC., East Alton, Ill. He succeeds Marshall W. Acker who is retiring.

James W. Wells, elected vice-president, GIEBEL, INC., New York.

Ralph L. Collett and Fred H. Bechill, appointed divisional vice-presidents, KAISER METAL PRODUCTS, INC., Bristol, Pa.

B. W. Bird, named head of the Fabricating Div., ATLANTIC STEEL CO., Atlanta.

Thomas P. Leddy, elected assistant vice-president, KELLOGG SWITCHBOARD & SUPPLY CO., Chicago.

Paul E. Hays, appointed superintendent of River Transportation, CRUCIBLE STEEL CO. OF AMERICA, Pittsburgh.

Charles F. Heise, elected to the board of directors, THE POLLAK STEEL CO., Cincinnati.

R. Randall Irwin, appointed manager of personnel and industrial relations, Brown Instruments Div., MINNEAPOLIS-HONEYWELL REGULATOR CO., Philadelphia.

E. Topanelian, Jr., appointed director of engineering, Engineering Div., GULF RESEARCH & DEVELOPMENT CO., the research organization of Gulf Oil Corp., and Bruce R. Walsh, appointed assistant director of engineering.

William C. Keeran, appointed executive engineer, VAPOR HEATING CORP., Chicago.

Norman R. Ekholm, appointed abrasive engineer, for northern California, southern Oregon, and western Nevada, NORTON CO., Worcester. He replaces Edward G. Petherick, who is retiring.

Fred R. Fielding, appointed chief engineer, Buffalo district steel plant, REPUBLIC STEEL CORP.

Arthur V. Fant, appointed chief tooling engineer, Aircraft Div., KAISER-FRAZER CORP., Willow Run, Mich.

Norman E. Risk, and Richard S. Frank, have been named assistant chief engineers, CATERPILLAR TRACTOR CO., Peoria.

H. T. Mellwain, named manager, Stone & Slag Div., BETHLEHEM STEEL CO. succeeding John P. Peacock, who has retired.

A. J. Hirons, appointed manager, Plant 24, Adrian, Mich., BOHN ALUMINUM & BRASS CORP.

F. H. Webster, appointed manager, Western Div. sales office, Chicago, HYATT BEARINGS Div., General Motors Corp.

Samuel H. Wood, appointed manager, Marion Forge Div., Marion Ohio, EATON MFG. CO.

Kenneth F. Landgraf, appointed director of industrial relations, Gunnison Homes, Inc., U. S. STEEL CORP., housing subsidiary.



VAN H. LEICHLITER, named vice-president — Operations, American Steel & Wire Div., U. S. Steel Corp.



D. T. MARVEL, appointed vice-president for sales, Olin Industries, Inc., East Alton, Ill.



GEORGE McMEANS, appointed vice-president in charge of Operations, Kaiser Steel Corp., Oakland, Calif.

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## Personnel

*Continued*

**David L. Gamble**, appointed manager of research, THE NEW JERSEY ZINC CO., Palmerton, Pa. He succeeds **George F. Stutz**, who has been transferred to development engineer, New York office.

**Hans K. Reitz**, appointed factory manager, COLONIAL BROACH CO., Detroit.

**Sidney T. Keel**, promoted to sales manager of rock phosphates, Phosphate Div., INTERNATIONAL MINERALS & CHEMICAL CORP., Chicago.

**John P. Coakley**, appointed eastern sales manager, New York, Engineering Works Div., DRAVO CORP., Pittsburgh.

**Donald U. Kudlich**, appointed manufacturing coordinator for the machinery divisions, FOOD MACHINERY & CHEMICAL CORP., San Jose, Calif.

**Carl N. Brown**, appointed sales manager, for Cast Iron Pipe, UNITED STATES PIPE & FOUNDRY CO., Burlington, N. J.

**Gordon E. Leopold**, promoted to district manager, Minneapolis office, HARNISCHFEGER CORP.

**John L. Ham**, appointed project manager, Metallurgical Dept., NATIONAL RESEARCH CORP., Cambridge, Mass.

**William V. Ryan**, appointed general sales manager, South Wind Div., STEWART-WARNER CORP., Indianapolis.

**William E. Henry**, appointed to the sales department, Pittsburgh district FIRTH STERLING, INC.

**B. M. Busby**, appointed general traffic manager, LONE STAR STEEL CO., Dallas.

**Fred Bode**, appointed district manager of sales, Wisconsin, LAPHAM-HICKEY CO., Chicago.

**Clay Hendricks**, appointed district manager, Chicago, DEWALT INC., subsidiary of American Machine & Foundry Co., Lancaster, Pa.

**Frank G. Moore**, appointed general traffic manager, COLUMBIA-SOUTHERN CHEMICAL CORP., Pittsburgh.



**A. F. FRANZ**, named president, John A. Roebling's Sons Corp., subsidiary of Colorado Fuel & Iron Corp.



**CHARLES ROEBLING TYSON**, named executive vice-president, John A. Roebling's Sons Corp., Colorado Fuel & Iron Corp. subsidiary.

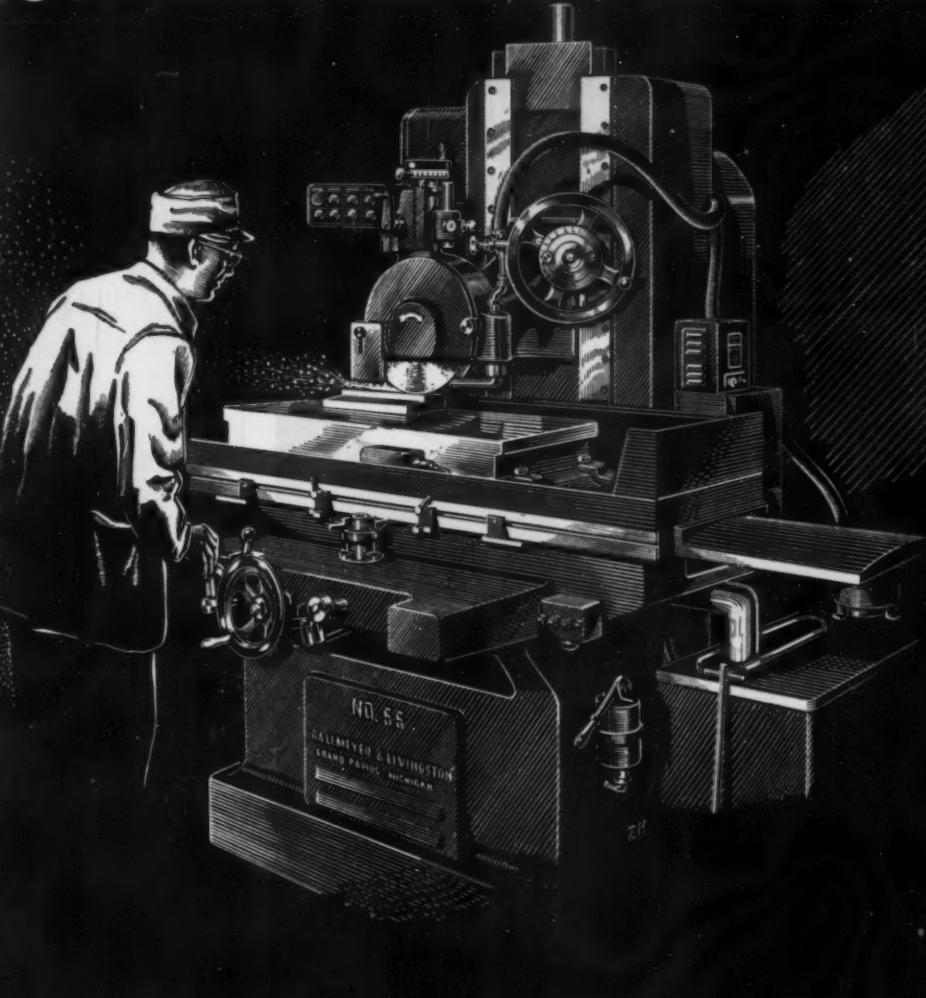


**CLARENCE H. PLEISS**, named director—manufacturing, Gunnison Homes, Inc., housing subsidiary of U. S. Steel.



**JOHN POAST**, named superintendent, Blast Furnace Dept., East Works Plant, Armco Steel Corp.

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## Personnel

*Continued*

**Sanford H. Bennett**, appointed chief industrial engineer — Casting Div., ALUMINUM CO. OF AMERICA, Pittsburgh; **H. E. Cook**, becomes works manager, Buffalo; **Norbert C. Hilbrecht**, named superintendent, Buffalo Works; and **Sherwood Willard**, named chief industrial engineer, Buffalo Works.

**Kenneth H. Smith**, appointed staff manager, on the headquarters labor relations staff, WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

**F. C. Campbell**, appointed purchasing agent, SCAIFE CO., Pittsburgh. Harry L. Oberlin, director of purchases has retired after 42 years service.

**J. H. Walters**, appointed Houston district sales manager, ROCKWELL MFG. CO., Pittsburgh.

**Paul J. Kondla**, named Eastern regional representative, Metal Chemicals Section, Industrial Chemicals Div., AMERICAN CYANAMID CO., and **A. E. Broady**, becomes representative in the Cleveland district.

**N. Charles Belasco**, appointed sales representative in Southern California, CONTINENTAL SCREW CO.

**Joseph A. Pfaff**, appointed special sales representative, LATROBE STEEL CO., New York headquarters; **William J. Kennelly**, appointed district manager, New York branch; and **Theodore H. Fortmeier**, appointed district manager, Milwaukee branch office.

## OBITUARIES

**W. Selmyn Ramsay**, president, Bay City Shovels, Inc., Bay City, Mich., recently.

**Robert E. Withers**, 87, director and retired senior vice-president, Aluminum Co. of America, in Wytheville, Va., recently.

**Raymond E. Strickland**, 61, chief land agent, Tennessee Coal & Iron Div., U. S. Steel, recently in Birmingham.

**W. E. Byrne**, 58, mid-west district manager, Simonds Abrasive Co., Chicago.

**Robert J. Weber**, 58, assistant district manager, central sales district, Westinghouse Electric Corp., Pittsburgh, recently.

Lap or butt—

# How to Design GOOD JOINTS FOR BRAZING



By W. J. Van Natten  
Development Engineer  
Turbine Div. Laboratory  
General Electric Co.  
Schenectady, N. Y.

In designing joints for brazing, lap joints should be used wherever possible. Butt joints should only be used where service requirements are not severe and leak tightness and strength are relatively unimportant. When base metals of different thermal coefficients of expansion are used care must be taken that a stress causing failure in the base metal is not introduced. Joint clearance is a factor in obtaining the maximum strength for a given design. There is a best joint clearance for each filler metal which will give the best joint strength. Conductivity is a principal factor in the electrical aspects of joint design. A properly designed joint should not add appreciably to the total electrical resistance of the circuit.

♦ BASE AND FILLER METAL selection type of joint and service requirements are the most important and best controlled factors in the design of joints for brazing. Good joint design may also depend on the brazing process used, method of fabrication before brazing, quantities to be brazed and the manner of applying the filler metal.

Lap and butt joints are the two and only basic type of joint design. However, there are many variations of these, and combinations of both used in brazing applications. Lap joints should be used wherever practical since the possibility of obtaining leak tight joints with 100 pct efficiency is greatest with this type of joint. The overlap area may be adjusted so that joint strength will be as strong as the weakest member despite lower unit strength of the filler metal or possible small defects in the braze. Increasing the overlap raises the factor of safety. One hundred pct joint efficiency is usually attained with an overlap three times the thickness of the thinnest member.

Butt joints, while not having the lap joint's disadvantage of increasing metal thickness, are

limited in joint area to the cross-sectional area of one member. To obtain high joint efficiency a filler metal equal in strength to the base metal must be used and the braze must be free of defects. Butt joints should be employed only where service requirements are not severe and leak tightness and strength are relatively unimportant. Tee and corner joints are classed as butt joints. Scarf joints, a variation of butt joints, are used to increase joint area. They are not desirable unless the joint area is three times the normal cross-sectional area. They are also more difficult to prepare and harder to hold in alignment during brazing.

The mechanical properties of a brazing filler metal in a joint seldom match those of the base metals being joined. In most cases, the unit strength of the filler metal is considerably lower. Filler metal unit strength is affected by joint clearance and defects such as porosity, flux inclusions and unbrazed areas. Table I shows base metals indexed against each other to give recommended filler metals. Where base metals of different coefficients of thermal expansion are used, care must be taken that a

## **"With automatic equipment pre-placement of the filler metal must be considered in design . . ."**

stress causing failure of the base metal or joint is not introduced during or after brazing.

In use, the joint may be subjected to tension, sheer, impact and fatigue stresses. Regardless of the type of stress, joint clearance, with its effect on the subsequent thickness of brazing filler metal in the joints, is a factor in obtaining the maximum strength for a given design.

Clearance between the brazed parts must be considered in terms of specific conditions, i.e., room temperature or brazing temperature. With similar metals of about equal mass the room temperature clearance before brazing is a satisfactory guide. When brazing dissimilar metals, or like metals differing greatly in mass, consideration must be given to the clearance at brazing temperature. Adjustments must be made in the room temperature clearance to achieve the desired clearance at brazing temperature.

The relation of joint clearance to shear strength is shown in Fig. 1. This represents joints of carbon steel made with Bag 1 filler metal and flux. Although not always as pronounced as in Fig. 1, there is a best joint clearance for each filler metal which will give the best joint strength.

### **Larger clearances permit flexibility**

In designing for maximum joint strength Table II may be used as a guide. If clearances less than those recommended in Table II are used, joint strength may fall appreciably because of excessive voids, flux inclusions, etc. Larger clearances will permit greater flexibility in machining but may waste filler metal and parts.

When brazing dissimilar base metals coefficients of thermal expansion and contraction should be checked, particularly in the brazing temperature range. If not, a number of difficulties may arise. Where one part fits inside the other, the expansion of the inner part may be such that when brazing temperature is reached there will be metal to metal contact. Proper clearances are not maintained and little filler will enter the joint. Greater expansion of the outer part on the other hand may increase clearances and prevent capillary action. If the brazing filler metal doesn't enter the joint, contraction of the inner part can result in fracture of the filler metal during cooling.

In designing a lap joint having maximum strength it should be noted that the strain, and therefore the stress, is higher at the ends of the joint. Another factor to be considered is the "couple" or bending moment created by the principal forces being offset from a common

axis. This stress at the ends of the joint introduces a tensile strength in the brazing layer and will contribute to the starting of a tear.

Failure which occurs progressively indicates excessive stress concentration at the point where tearing starts. Little may be accomplished by increasing the length of the overlap. In good joint design stress concentration that causes tearing is avoided. This can frequently be done by imparting flexibility to that part of the assembly where joint failure is apt to start or alternatively stiffening a flexible part at the joint. Fig. 2 shows good and bad designs for the loadings shown.

Joint design should take into account the manner in which the filler metal is to be introduced. When joints are brazed manually the filler metal is usually face fed and few difficulties are encountered. However, when automatic equipment is used the preplacement of the filler metal must be considered in the design. It may be preplaced in the form of wire, shim or strip, powder, etc., with wire and strip mostly used. The number of ways in which wire may be preplaced is shown in Fig. 3. In designing for mechanical strength it is essential to subtract the grooved area from the joint area. Where shim or thin flat sections of brazing filler metal are to be preplaced, joints should be designed to permit the parts to close up the clearance by applying pressure to the joint during the brazing cycle, see Fig. 4. Thus, excess filler metal and flux is squeezed out of the joint.

Conductivity is the principal factor to be considered in the electrical aspects of joint design. When properly designed the joint should not add appreciable resistance to the electrical circuit. In general brazing filler materials have very low electrical conductivity compared to copper. BCuP-5 has about 10 pct and Bag-6 about 24.0 pct of the conductivity of copper. If recommendations on joint clearance given in Fig. 2 are followed a brazed joint shouldn't add any appreciable amount of resistance to the circuit. The shorter path through the brazing filler metal compared to the longer path through the conductor causes only a small increase in total circuit resistance.

In practice there will be a certain amount of voids, etc., which cut the effective area for an electrical path. Therefore, lap joints should be

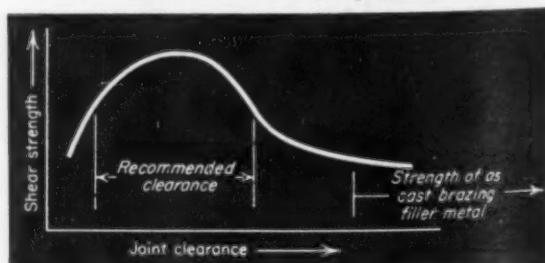


FIG. 1—Relation of joint clearance to shear strength is shown in graph above. Brazing was done with silver alloy filler metal and low carbon steel.

FIG. 2—Examples of good and bad joint design. Stress concentration that causes tearing should be avoided.

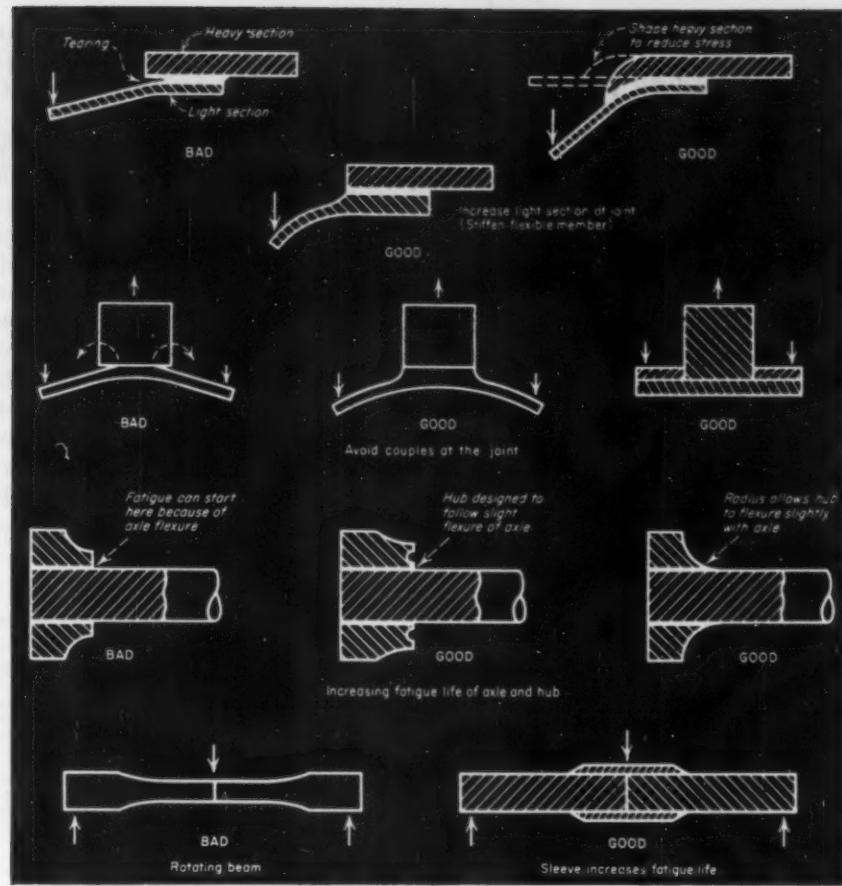


TABLE I

### BASE MATERIAL VS. FILLER METALS

| Base Material                 | Al and Al Alloys | Mg and Mg Alloys | Ni and Ni Alloys       | Carbon and Low Alloy Steels | Stainless Steels       | Irons            | Copper and Copper Alloys | High Carbon and Tool Steels | Heat Resistant Alloys |
|-------------------------------|------------------|------------------|------------------------|-----------------------------|------------------------|------------------|--------------------------|-----------------------------|-----------------------|
| Al and Al Alloys .....        | BAI Si           |                  |                        |                             |                        |                  |                          |                             |                       |
| Mg and Mg Alloys .....        | X                | BMg              |                        |                             |                        |                  |                          |                             |                       |
| Ni and Ni Alloys .....        | X                | X                | BAG, BCu BCu Zn BNi Cr |                             |                        |                  |                          |                             |                       |
| Carbon and Low Alloy Steels.. | X                | X                | BAG, BCu BCu Zn BNi Cr | BAG, BCu BCu Zn BNi Cr      |                        |                  |                          |                             |                       |
| Stainless Steels .....        | X                | X                | BAG, BCu BCu Zn BNi Cr | BAG, BCu BCu Zn BNi Cr      | BAG, BCu BCu Zn BNi Cr |                  |                          |                             |                       |
| Irons .....                   | X                | X                | BAG, BCu BCu Zn        | BAG, BCu BCu Zn             | BAG, BCu BCu Zn        | BAG, BCu BCu Zn  |                          |                             |                       |
| Copper and Copper Alloys....  | X                | X                | BAG, BCu Zn            | BAG, BCu Zn                 | BAG, BCu Zn            | BAG, BCuP BCu Zn |                          |                             |                       |
| High Carbon and Tool Steels.. | X                | X                | BAG, BCu BCu Zn        | BAG, BCu BCu Zn             | BAG, BCu BCu Zn        | BAG, BCu BCu Zn  | BAG, BCu BCu Zn          |                             |                       |
| Heat Resistant Alloys .....   | X                | X                | BAG, BCu BCu Zn BNi Cr | BAG, BCu BCu Zn BNi Cr      | BAG, BCu BCu Zn BNi Cr | BAG, BCu BCu Zn  | BAG, BCu BCu Zn          | BAG, BCu BCu Zn BNi Cr      |                       |

Note: Brazing Filler Metals are designated by AWS-ASTM Classification. X = Not recommended.

used wherever possible. A lap length 1.5 times the thickness of the thinner member joined will give a resistance equal to a solid length of copper. This rule has been used widely with good results. Longer laps may be used where necessary.

Brazed joints in cylindrical bodies, hollow containers, etc., should if possible be designed in accordance with rules already established

for pressure vessels. They are based on factors of safety of four or five and the size of joints are specified accordingly. For low pressures or a vacuum, joint proportions can be safely reduced. Joints in these assemblies should be of the lap type wherever possible as these give the strongest joint and also provide for a larger brazed area with less chance for leaks to occur.

Proper venting is a principle factor in the

**"Dead end holes may be considered small pressure vessels . . ."**

design of pressure or vacuum tight assemblies. Heat from the brazing operation expands the air or gases in the assembly so rapidly that unless well vented the assembly might be forced apart. At the same time forces act on the filler metal entering and flowing through the joint and tend to minimize the effect of capillary action. Good and bad joint design for pressure vessels is shown in Fig. 5. Dead end holes may be considered small pressure vessels and joints in such cases should be designed with vents to eliminate build-up of pressure during the brazing cycle.

Since all metals and alloys tend to lose strength as temperature increases brazed joints can be expected to act in the same manner.

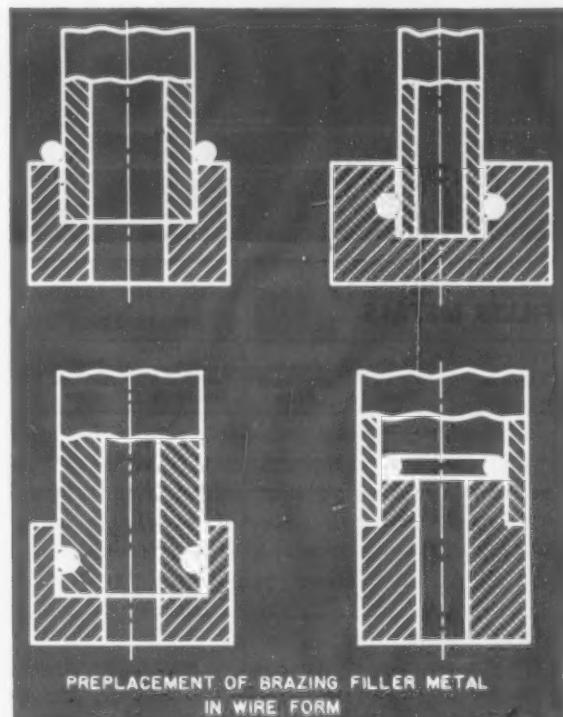


FIG. 3—Various ways in which wire may be preplaced. In designing joints for mechanical strength it is essential to subtract the grooved area from joint area.

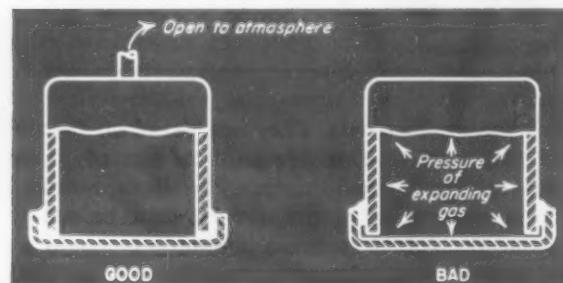


FIG. 5—Good and bad joint design for pressure vessels. In figure at left, opening permits pressure to be relieved during the brazing cycle.

Table III gives maximum operating temperatures for each particular type of filler metal and is based on continuous service at this temperature. Many joints made with these filler metals will withstand much higher service temperatures for short periods of time with reduced stress requirements. When applications demand service temperatures other than those indicated adequate tests should be made to determine whether the brazing filler metal chosen will meet the necessary requirements of time, temperature and stress involved.

In designing joints for sub-zero service temperatures, present data indicates that tensile, shear and impact properties of brazed joints are affected similar to the base metals being joined to at least—100°F.

TABLE II  
RECOMMENDED JOINT CLEARANCES\*

| Filler Metal<br>AWS-ASTM Class<br>BAISI Group..... | Joint Clearance, ** in.<br>0.006-0.010 Length of lap less than 1/4 in. |
|--|--|
| BCuP Group.....                                    | 0.010-0.025 Length of lap greater than 1/4 in.<br>0.001-0.005          |
| BAg Group.....                                     | 0.002-0.005  |
| BCuAu-1, BCuAu-2.....                              | 0.002-0.005  |
| BCu.....   | † 0.001 to 0.002   |
| BCuZn Group.....                                   | 0.002-0.005  |
| BMg.....   | 0.004-0.010  |
| BNiCr.....   | 0.002-0.006  |
| BAgMn.....   | 0.002-0.005  |

\* At brazing temperature.

\*\* For round or tubular members this means a clearance on the radius.

† For maximum strength use 0.000 in. clearance or press fit.

TABLE III  
MAXIMUM SERVICE TEMPERATURE

| AWS-ASTM Class    | °F   |
|-------------------|------|
| BCu-P Group.....  | 300  |
| BAg Group.....    | 400  |
| BCu Zn Group..... | 400  |
| BCu.....          | 400  |
| BAg Mn.....       | 500  |
| BNi Cr.....       | 1000 |

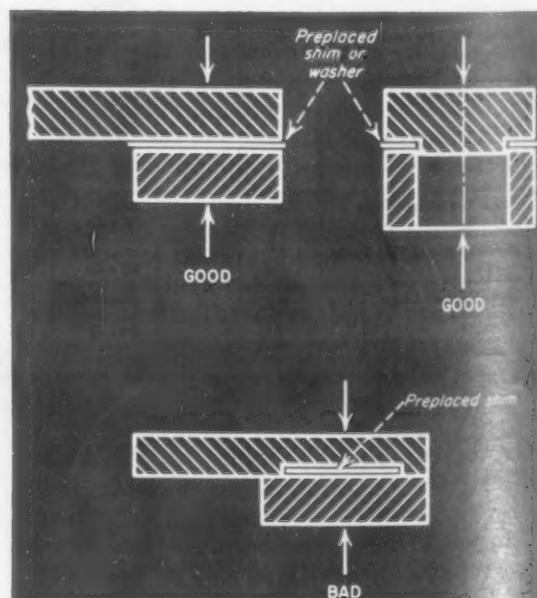


FIG. 4—Where shims or thin flat filler sections are to be preplaced, joints should be designed to permit parts to close up the clearance by applying pressure.

# British Claim Patent Rights for Shell Molding

Following is a statement issued by Lord Trefgarne, Chairman of Directors, Polygram Casting Co., Ltd.

♦ "The original conception of the shell-moulding process was due to Johannes Croning, of Hamburg, who at various dates between 1937 and 1947 developed the process in Germany up to the elementary stage disclosed in an official document published in the United States and the United Kingdom. This document is known as the Field Information Agency Technical Final Report No. 1168 (known for short as F.I.A.T. Report), which was published on May 30, 1947. Prior to the publication of this Report, however, a number of patent applications were made in the United Kingdom and elsewhere by Polygram Casting Company, Limited. Some of these applications have now been accepted, and a large number of additional later applications covering important new features of the process or its mechanization are owned by the company.

"Although the original conception was that of Herr Croning, it is only since the war that methods, especially methods of mechanization, have been developed to the stage of commercial application. Polygram Casting Company, Limited, are now able to state that their patent position, being based on new features, constitutes not only a strong positive patent position, but a measure of practical assurance against claims by third parties for infringement. The company makes this statement with unique knowledge of the patent situation in this field.

Reprinted from Foundry Trade Journal, Nov. 20, 1952

"In considering, therefore, the strength of the Patents protecting the Polygram Process, it would be a serious mistake to assume that in its commercially practicable form it is open to free exploitation, and that no Polygram license is necessary. Whether or not any early features of the process are affected by post-war legislation in any individual country, no subsequent development for which a United Kingdom or United States or any other Patent (or Patents) has been or may be granted is affected by any such legislation. The position in the U.S.A. was succinctly put in a report issued for the guidance of the United States foundry industry in 1952 by the Office of Technical Services of the United States Department of Commerce, Washington. 'Naturally,' said this Report, 'if a U. S. Patent or Patents should be granted on specific improvements, an industrial user must not employ such improvements without obtaining a license from the patent holder.'

"In the United Kingdom and in certain other countries, the Polygram patent position is much stronger than the corresponding patent position in U.S.A., for reasons which will become clear in due course, and these patent rights apply not only to the new mechanical inventions issued by Polygram, but to certain features of the shell-moulding process itself.

"The sum of these new developments (while utilizing the basic principle of investment of metal patterns by a mixture of sand and thermosetting resin) build up into what may fairly be called a distinctive technique. To this technique the company has given its name, and it is now known throughout the world as the Polygram Shell-moulding Process. It is the Polygram Process which is the subject of license to a considerable number of British and overseas firms. The Polygram Casting Company owns Patents and patent applications\* of which the official numbers are listed.

"Many of the claims identified above, date back from one to six years and it must be obvious that companies who embarked later than Polygram on experimental work may find, after much delay and expense, that their developments are already ante-dated by pending or complete Patents.

"In addition to its patent rights, Polygram Casting Company possess extensive experience and "know-how" gained during the past six years. Some years ago Herr Croning paid various visits to their works, the official consent of the Board of Trade having been given for the exclusive use of his advice. The Polygram Process is more technically described in a detailed manual of operation which, like the right to use its patent rights, is made available only to the company's licensees. Among these licensees are a number of firms of the highest standing.

"Patent applications are not published until a complete specification has been accepted, and in the present state of congestion in the Patent Office it may take some time before the whole of Polygram specifications, dated from January, 1947, onwards, emerge for public scrutiny. A number of these, however, have been published, and rapid progress is now being made, especially with the Patents for mechanical application.

"The delay in completing Patents, it should be explained, does not affect the date from which they are valid when granted."

\* United Kingdom: 646223, 668821, 674422, 677434, 14963/51, 14964/51, 14965/51, 20521/51, 20522/51, 15407/52, 20081/52, 20082/52, 21782/52, 674421, 681368. U.S.A.: 307644, 307645, 293528, 307646. Canada: 635869, 632165, 635870, 635871. Australia: 10805/52, 4452/51, 4453/51, 4654/51, 12201/52. South Africa: 383/47, 384/47, 10444, 2155/51, 385/47, 2156/51, 10443, 2157/51, 2072/52. India: 47500, 47501, 47502, 47976, 40441, 45346, 47517. Pakistan: 3496.

# Industry Gets CHEMICALLY CLEAN STEEL DRUMS

A rust-inhibiting treatment previously used in the automotive and appliance industries is now applied to steel drums. In nine pre-finishing stages, the drums are cleaned, rinsed and phosphatized to give them better paint adherence and under-finish rust resistance. Residues and contaminants are completely removed to assure customers of higher product purity.

• NOW, FOR THE FIRST TIME, industrial users can obtain steel drums that are 100 pct chemically clean, scale-free and rust-inhibited. Some pre-treatments require only grease removal with mineral spirits or in vapor degreasing equipment. Others specify the use of a phosphoric acid wash. In the Granodizing process, drums fabricated from hot-rolled steel are not only freed from grease, oil, dirt and scale, but are protected by a rust-inhibiting nonmetallic crystalline zinc phosphate coating over the entire inner and outer surfaces.

The rust-inhibiting properties of these zinc phosphate coatings are as required by the Interim Federal Specification for Metal Drums (RR-D-729b). The coatings not only meet the specification requirements of Grade 1, JAN-C-490, but have been used in the automotive and appliance industries for finish durability and under-finish rust resistance. The practice of protectively coating chemically clean drums for industrial purposes is new.

Cleaning and phosphate-coating operations at the United States Steel Products Division drum plant in Port Arthur, Tex., are done in one of the largest power spray washers in the world. Continuous spray phosphatizing machines such as this are used where large numbers of similar products are treated. Since phosphatizing is effective only on grease-free surfaces, such machines must provide the necessary zones or stages to remove all impurities. This is done by passing the work on a conveyer through nine cleaning or rinsing stages.

At this plant, a zinc phosphate coating of 150 to 200 mg per sq ft has been determined as the optimum. A lesser coating increases the danger of rusting and a heavier coating tends to break off under reverse impact conditions.

In the final treatment, the machine must remove excess coating chemicals and apply a surface conditioner. This is called "acidulated final rinsing" which is done with very dilute solutions containing chromic-phosphoric acid. Such treatment is very important if highest corrosion resistance and resistance to blistering is to be obtained from the organic finish of the final coating.

Application of the process involves treating of the unassembled shell, head and bottom drum sections. Treatment of these sections after fabrication eliminates the possibility of damage to the rust-inhibiting coat which may result from the severe forming operations and by welding the side seam. Final assembly of the component parts does not affect the coating.

Runoff of the cleaning and rinsing solutions from each stage is collected in a tank and resprayed. Replenishment of chemicals or replacement of solutions takes place in the collecting tanks. Screens in the tanks remove foreign particles from the solutions and constant level floats act to replace losses due to evaporation.

After the Granodizing treatment, the inside surfaces of the drums are entirely free of grease, oil, dirt and drawing and stamping compounds. Objectionable mill scale is completely removed. The zinc phosphate coating

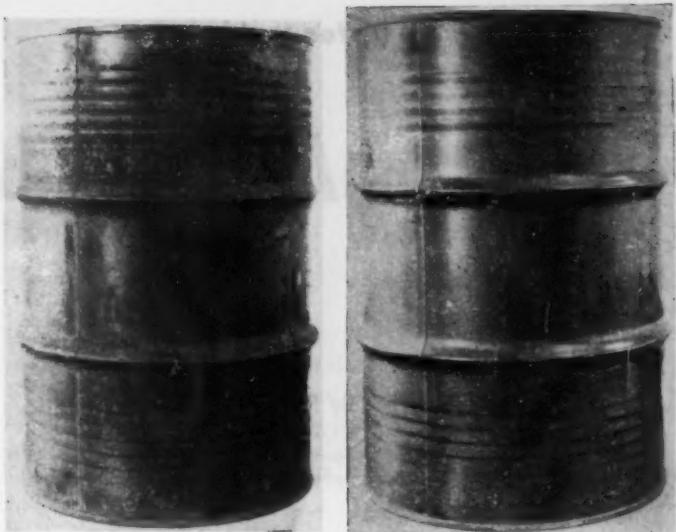
## STEPS IN GRANODIZING PROCESS

### I. CLEANING

- (1) Alkali cleaning with a heavy-duty industrial alkali to remove grease and drawing lubricant.
- (2) Rinse to prevent carry-over of alkali to pickling stage.
- (3) Sulfuric acid pickling with the use of inhibitor to remove scale.
- (4) Rinsing in unheated water, overflowing.
- (5) Rinsing in unheated water, overflowing.
- (6) Rinsing in unheated water, overflowing.

### II. COATING

- (7) Phosphatizing in a zinc phosphate solution.
- (8) Rinsing in unheated water, overflowing.
- (9) Rinsing in hot, very dilute chromic-phosphoric acid.
- (10) Drying in hot air oven.

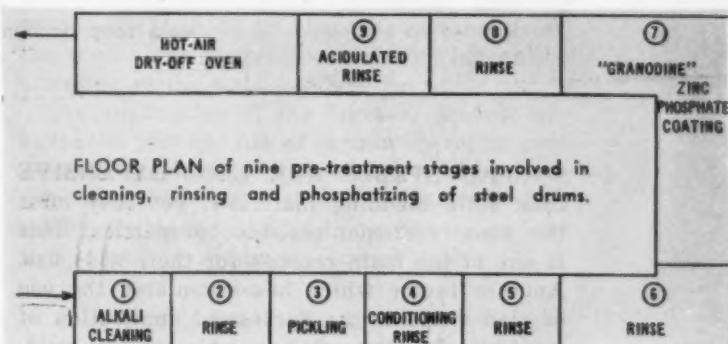


ONE-YEAR EXPOSURE to weather ruined the paint finish of untreated steel drum (left) but had little effect on phosphate-coated drum (right). Coating provides a firm, durable bond for paint and retards corrosion.

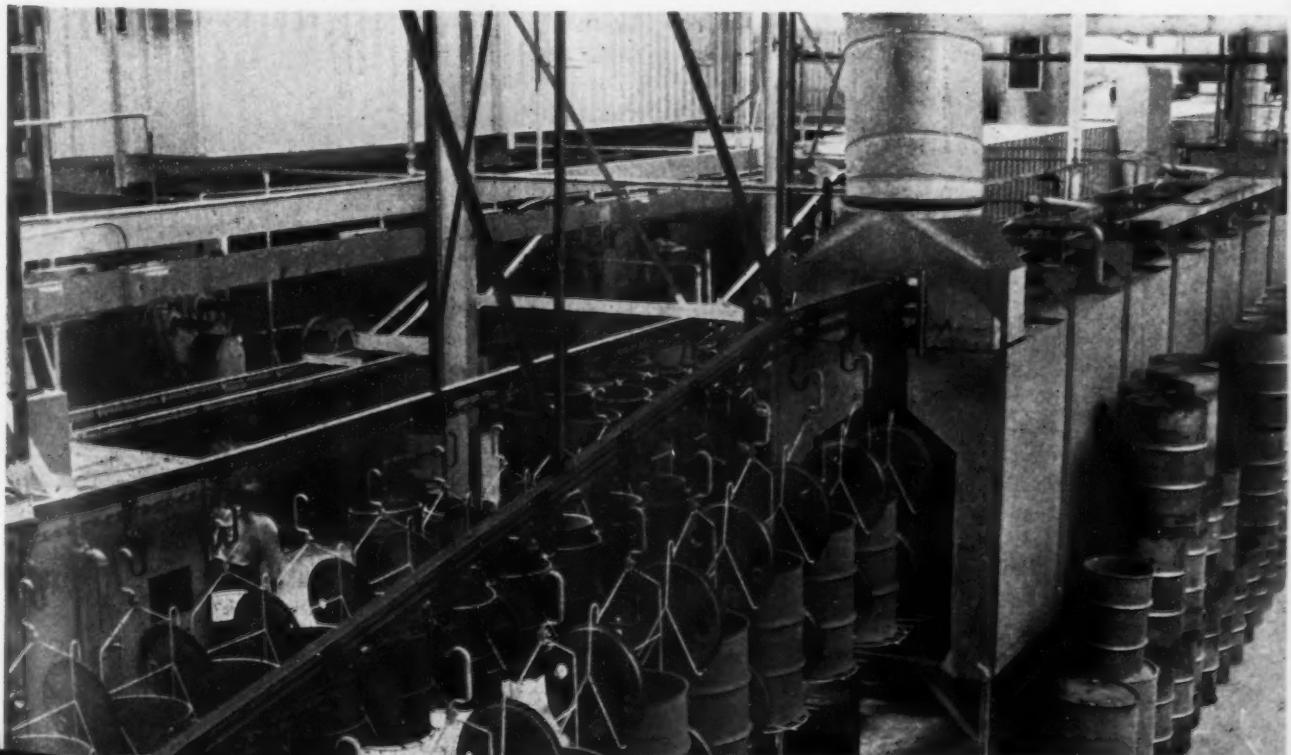
bonds the exterior paint tightly so that the finish is durable and better appearing. This coating also suppresses under-finish rusting if the paint is accidentally scraped off.

These treated drums are cleaner than drums cleaned by handwiping with solvents or mineral spirits. In "handkerchief tests," no residue or contaminants of any kind remained inside the drum. This assures customers that products shipped in these containers will not be contaminated by loose scale or other foreign particles.

**POWER SPRAY WASHER** at U. S. Steel Products Div. Plant is one of the world's largest. Installation conveys parts of steel drums through nine cleaning, rinsing and phosphate-coating zones or stages. Drying ovens remove moisture from drums prior to paint spraying.



FLOOR PLAN of nine pre-treatment stages involved in cleaning, rinsing and phosphatizing of steel drums.



**Cleaner, faster welds—**

# NICKEL-CLAD STEELS welded by SH



By Richard G. Lyall

Chief Engineer  
Farrar & Trefts, Inc.  
Buffalo

Products fabricated of clad steels have corrosion-resistant properties equal to those of solid cladding materials if welded properly. At Farrar & Trefts, Inc., nickel-clad evaporators for the alkali industry are welded by the inert-gas-shielded metal-arc process without iron pickup in the weld. The use of uncoated welding wire and an inert gas blanket to protect the weld zone account for the clean welds which require no slag removal.

♦ CLAD STEELS ARE LESS EXPENSIVE than solid cladding materials, yet they offer the same corrosion-resistant properties. This is one of the main reasons for their wide use. Another factor which has stimulated the use of clad steels is the successful application of inert-gas-shielded metal-arc (Aircomatic) welding to the fabrication of these materials.

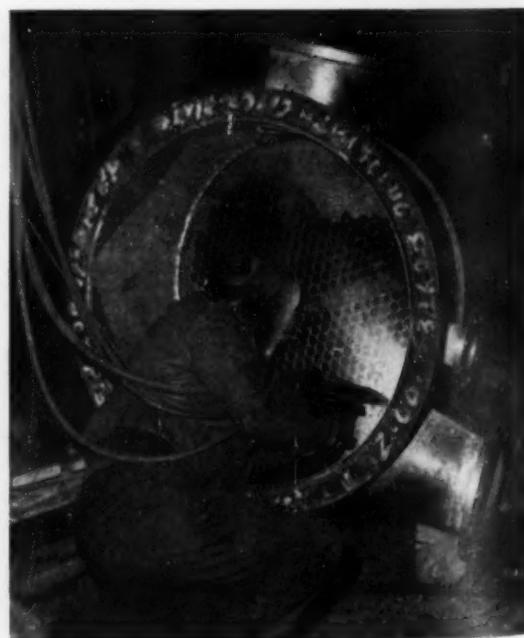
This process not only makes economies possible by the use of the less costly clad steels, but produces excellent results at lower production costs in relation to the welding operation itself. Products such as heat exchangers, condensers and evaporators, which must satisfy severe corrosion-resistant requirements, are currently being welded by this process.

The fabrication of evaporators for the alkali industry by Farrar & Trefts, Inc., is a good example how the process is used to weld nickel and nickel-clad steel. The evaporator units, made of  $\frac{1}{2}$ -in. thick 20-pct nickel-clad steel, must offer maximum corrosion resistance while in service. Internal parts, including the  $\frac{5}{16}$ -in. thick tube sheets and the steam chest tubes, are of solid nickel.

Seams in the clad plate are welded from the clad side. Commercially pure nickel welding wire in coiled form and of  $\frac{1}{16}$ -in. diam is deposited under a protective blanket of argon flowing at the rate of 60 to 80 cu ft per hr. Wire feed is 250 in. per min for the 20-pct nickel-clad plate and 210 in. per min for the solid nickel plate. Reverse polarity dc is used

at 275 to 300 amp. Joint preparation from the outside is a  $60^\circ$  single bevel.

Clad steel generally consists of carbon steel or a low-alloy high-strength steel to which a



WELDING OF TUBE SHEETS is viewed from the liquor box end of steam chest. The operator is making a  $\frac{1}{2}$ -in. fillet weld at about 10 in. per min.

# Shielded Metal-Arc Process

veneer of cladding metal is integrally and permanently bonded. The normal thickness of the clad metal is 10 to 20 pct of the total plate thickness. The basic welding problem with clad materials is that of holding iron dilution or iron pickup in the deposit within allowable limits. If penetration is too deep, iron pickup from the steel plate will contaminate the nickel deposit and reduce its corrosion resistance.

Penetration can be varied with this process to help control base metal dilution. Dilution can also be controlled with other welding processes by using proper procedures, but the deposition speeds and quality deposits obtainable with this process enhance its use on clad materials.

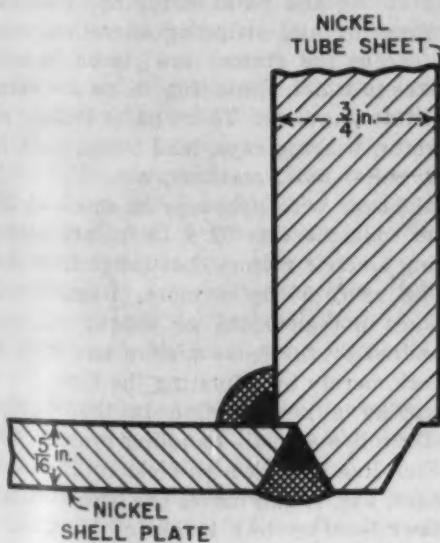
The process not only produces weld deposits with low iron pickup but saves considerable time in cleaning welds between passes. Speed of deposition alone greatly assists in reducing undesirable effects on metals from prolonged exposure to heat.

Elimination of cleaning between passes is

possible because the coiled welding wire is not coated. The shielding medium is an inert gas which simply diffuses in the atmosphere. The completed weld is clean and requires no slag removal. Multipass welding can thus be carried on without interruptions.

An important feature of using an inert gas to shield the weld is that the arc and the weld pool are constantly visible. Good visibility enables the operator to exercise control and reduces the risk of unsatisfactory welding. Moreover, the arc is self-regulating in that the rod burns back automatically to maintain a proper arc length. There is no need to feed the rod continuously or to adjust its distance from the work. The operator can devote his entire attention to the weld puddle.

The application of the inherent process advantages, plus the use of certain operating procedures, provides for better control of penetration, minimum iron pickup and maximum corrosion resistance. All of these factors add up to a superior product at reduced cost.



JOINT DETAIL between tube sheet and shell plate. Outside point has a 60° included angle. Weld on inside is a 1/2-in. fillet made at a speed of 10 in. per min. Both welds were made in two passes.



THIS 72-in. DISHED HEAD being welded by Airco-matic process is used as a cover for the steam chest.

**Hands Off—**

# Improved Materials Handling SPEEDS MOTOR REPAIR



By **W. G. Patton**  
Asst. Technical Editor

By combining modern assembly line materials handling techniques with proper processing controls and efficient assembly fixtures, Westinghouse-Detroit has eliminated unnecessary physical handling in servicing electric motors. A Stak-Rak crane handles loads up to 2000 lb. A unique control board shows the location of all parts (except the stator) of all jobs in process.

• DOWN-TIME for maintenance and repair of electric motors that drive conveyer lines, pumps and machine tools in auto plants is costly. Recognizing this, Westinghouse engineers recently introduced at Detroit a well-integrated assembly line that virtually eliminates manual handling of electric motors requiring re-building or routine maintenance.

Improvement in service delivery schedules, better working conditions and improved productivity have resulted from use of the new service-repair setup.

Motors arriving at the Detroit plant dis-assembled. The stator follows one roller conveyer line; remaining parts are processed on a second line. These parts are placed in a metal basket for degreasing and paint stripping. Following the degreasing and stripping operation, motor parts (except the stator) are placed in metal tote boxes to which angle iron strips are welded to facilitate handling. These parts include end bells, rotor, bearing caps, lead boxes, fans, fan guards, bolts, nuts, washers, etc.

Metal boxes with openings as small as 20 x 11½ in. containers to 32 x 19 in. are used in repairing electric motors that range from fractional hp up to 50 hp or more. Regardless of variations in dimensions or weight, all parts are handled by the same pickup and with the same fork merely by adjusting the forks.

Occupying a key position in the Westinghouse-Detroit materials handling system is the 1-ton Stak-Rak crane which picks up the loaded tote boxes, Fig. 1, and moves the load vertically from floor level up to a height of 11 ft and in any desired direction. Loaded tote boxes are easily set down on the steel racks and can be picked up from the racks and moved to any desired location in the service area in a few seconds.



FIG. 1—Operator of the Stak-Rak crane moving a tote box filled with motor parts into position on the storage rack. Safety bar, circle, protects operator's feet.

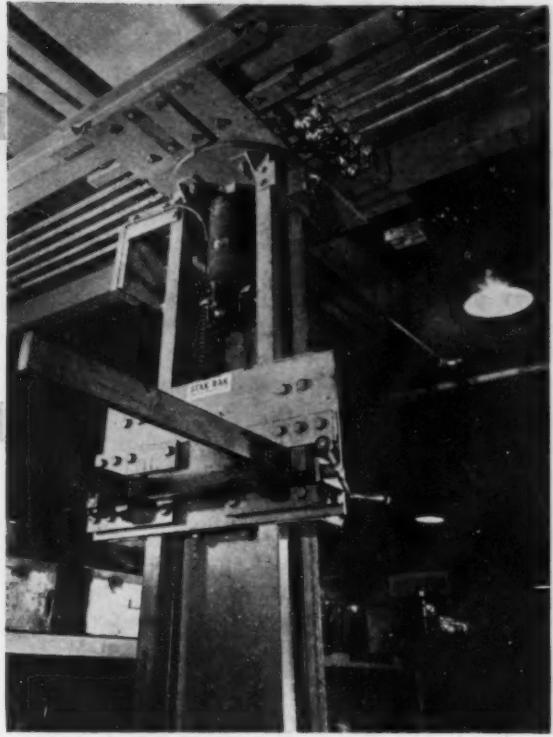


FIG. 2—Closeup of the crane fork employed to pick up the steel baskets from storage racks. The crane moves horizontally along ways and rotates right or left.

The storage system is flexible in operation. Steel racks are designed to receive and store material on either side of narrow aisles. A crane bridge, Fig. 2, spans the entire storage area and travels lengthwise to any desired depth. The fork, carrying the loaded tote box then swings into position for unloading or loading.

The electric fork lift, suspended from an overhead trolley, revolves to serve either side of the aisles. Push button controls enable the operator, walking with the load, to place motor parts at the desired position or to remove them.

Operating controls of the lift are simple. Two buttons, located on the left side of the steel column which carries the load, control the powered up and down movement. North and south movements are also powered, and are controlled by two buttons at the right. East-west movement is accomplished by physical movement of the load along carefully leveled crane ways.

Fast-acting controls make it possible for the operator to place the load in the desired location without backing or filling.

An unusual feature of the crane is its ability to turn a load  $360^{\circ}$  in one direction and  $345^{\circ}$  in another direction. This movement is accomplished manually. If desired, stops can be arranged so that the load can be rotated  $360^{\circ}$  in either direction.

The small wooden roller attached to the bot-



FIG. 3—Metal tags inserted on this board show the exact position of every job on the storage racks.

tom of the steel column on which the controls and the loading fork are mounted, prevents the possibility of an operator catching his foot underneath.

The present motor storage handling system

**"Engineers arranged the shelves so tote boxes would be within reach of the crane at all times."**

replaces an earlier arrangement in which the practical limiting height of storage shelves was about 5 ft. There were five shelves. In some cases, it was necessary to use a rope to move heavy parts. Adequate clearance was not always provided. Often, manual handling of heavy loads was necessary.

In designing the new, steel storage racks, Westinghouse engineers arranged the shelves so tote boxes would be within reach of the crane at all times. Adequate clearance was provided by raising the height to 7 ft and using only three shelves instead of five.

Another feature of the Westinghouse-Detroit motor service-storage racks is the location board, Fig. 3, which makes it possible to locate quickly the parts for any job in the shop. When motors arrive for service, a metal tag showing the job number, is made out in triplicate. One tag is attached to the stator which moves along a separate roller conveyer line. The second metal tag goes with the box of motor parts. The third tag is placed in a proper position on the location board which shows immediately the exact location on the storage shelf where the motor parts may be found. Easy location of the work—plus ease of pickup and movement of the tote box—have greatly facilitated the next operation which is final assembly of the motor.

**Special assembly fixture used**

The final step of re-assembling a motor is to bring the stator and other parts together. The Stak-Rak crane picks up the box of parts and conveys the load 30 to 35 ft to a special steel assembly fixture, Fig. 4. This centrally located rotating table has adequate adjacent table work space and partitioned sliding drawers underneath. It has a complete set of tools and necessary bolts, nuts, washers and electrical connections. The round table on which the motor rests can be rotated 360°, and may also be hydraulically raised and lowered.

Easy accessibility of tools and materials saves thousands of unnecessary steps in the shop every day. Flexibility of the assembly table eliminates the necessity for employees working in an uncomfortable or inefficient position.

Assembly tables like those in Fig. 5 are also used. Again, materials and tools are within easy reach of the operator. Equipped with rollers, these tables can be moved to any desired location on the floor. This makes it possible to move an uncompleted job out of the way at the end of the day or at any time during the work shift.



FIG. 4—Special tables are employed to facilitate assembly of the motors being repaired. The table can be raised or lowered or the work can be rotated if desired.



FIG. 5—Lowering a tote box filled with motor parts onto a bench designed to hold necessary tools and save steps for the repairman. Benches are equipped with rollers and can be moved to any desired location in the plant.

Following final assembly and inspection, motors are pushed manually over roller conveyers to the shipping room for crating or direct delivery to trucks equipped with special shipping fixtures.

# NEW FILMS

◆ A BROADENING PERCEPTION of business communication problems has, in recent years, turned more and more business executives to motion picture films as a means of telling the facts of industrial life. Visually—often with color—and aurally, a message may be vividly impressed at low cost. Be it a new method of machine operation, a trip through a mill, product demonstration, the medium provides a stimulating and resourceful means of reaching a large audience.

Such films represent a heavy investment in money and time. They offer to all industry the cumulative efforts of individual approaches to a host of common industry problems. Often they tell a "how to" story which may be simply translated into action in the small plant. Rich in both background and specific industrial information, many of these films are available for industry use at nominal or no rental charge!

To aid industry in keeping pace with new films pertinent to the metalworking operations, THE IRON AGE will regularly review new film issues. If your company has a new film available to industry, which you wish reviewed, please send the following information: Title, catalog number if any, a brief summary of content, type of film, i.e., black and white, color, sound and rental cost.

*"Ropes of Steel."* Describes manufacture of steel wire rope, from ingot to finished product. Typical applications in mine hoists, shovels, draglines, and oil rings are shown. Fast moving, instructive. Intended for use by colleges and engineering societies. Running time 35 min, color, sound, free loan. Bethlehem Steel Co., Publications Dept., Bethlehem, Pa. (Review material supplied by The H. W. Wilson Co., 950 University Ave., New York 52.)

*"Shell Molding."* A short film on shell molding. Produced by the National Assn. of Manufacturers for use on "Industry On Parade" television program, the film provides an excellent introduction for discussion of shell molding techniques. Suitable for technical societies and engineering schools. Black and white, sound, 16

mm, free loan. Twenty-two mounted display photographs available for use with the film. Speaker available for evening if sufficient advance notice is given. The Cooper Alloy Foundry Co., Bloy and Ramsey Aves., Hillside 5, N.J.

*"The Manufacture of Cast Iron Pipe."* Designed for engineers and students, the film details centrifugal and sand mold casting of pressure pipe. Beginning with the raw materials—iron, coke, lime, scrap, soda ash and alloy—the film shows melting furnaces, casting, heat treatment, testing and handling of the finished product. Running time 28 min, color, printed narration, free loan. Sponsored by the Cast Iron Pipe Assn. (Review material supplied by The H. W. Wilson Co., 950 University Ave., New York 52.)

*"The Story of Lead."* Aimed at students of mining and metallurgy, employees of metalworking plants. A revision of an earlier Bureau of Mines film, the picture portrays steps in production of lead from drilling through mining, milling, smelting and refining. Shows mechanical loaders, and rail and shuttle car transportation. Various steps in the smelting operation from loading the furnace through casting are described. Sponsored by St. Joseph Lead Co., 250 Park Ave., New York 17. Running time 22 min, black and white, sound. Free loan from Bureau of Mines, Graphic Services Section, 4800 Forbes St., Pittsburgh 13. (Review material supplied by The H. W. Wilson Co., 950 University Ave., New York 52.)

*"Corrosion In Action."* Designed for engineers, the film describes the nature of corrosion—the anode and cathode processes. Shows origins and characteristics of corrosion currents. Describes passivity and protective films. Action is explained through time-lapse photos which compress the results of several hours of corrosive action into a few seconds on the films. Animated drawings are also used. Running time 70 min, sound, color, 16 mm, free loan. Corrosion Engineering Section, The International Nickel Co., Inc., 67 Wall St., N.Y. 5.

# AIR— Key to Small Plant Automation



By Arthur H. Allen  
Consultant

Air power and control can be the key to small scale automation in your plant. A host of industrial operations can be easily mechanized and speeded with air powered tools and controls. These new tools may tax your air compression-distribution system. Here are some suggestions for help in planning for future air needs.

◆ BENEFITS OF INCREASED MECHANIZATION and automation are often available to the small plant through wider use of relatively inexpensive air powered tools and controls. Growth in the use of such tools during the past decade reflects the wide power, close control and general low cost operation which air power has made possible. Rapid expansion in use of air tools, however, presents problems in air system operation and maintenance directly related to the expanding demands for air.

To get the most from a compressed air system, some care must be used in selecting and installing equipment, and in laying out the distribution system.

A compressed air plant consists of one or more compressors, compressor driver, control or regulation, intake air filter, aftercooler, air receiver, interconnecting piping, and a distribution system to carry the air to points of use.

Before attempting to determine the amount of compressed air necessary, a study should be made to provide for the use of air power in all suitable applications and to anticipate future needs.

In working out an installation, studies should determine: (1) Necessary compressor capacity; (2) Number of compressor units; (3) Location of compressor units; (4) Regulation of compressed air plant; (5) Compressed air distribution system.

Local experience, compressor load factors, tool load factors, etc., also provide a sound

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THE AUTHOR—Mr. Allen studied metallurgical engineering at Case Institute of Technology and, as editor and consultant, has for many years reported new industrial developments.

basis for determining capacity for installation of new compressor plants and extension of old plants.

Many air devices operate almost continuously. Others, operating infrequently, require a relatively large air supply. Actual air used by any device will vary considerably in different applications.

Average air consumption of tools should be determined from manufacturers' literature or by test. Since all air-operated devices do not consume maximum air under all conditions, an individual tool load factor should be used. This load factor is the ratio of actual to maximum continuous full load air consumption and is the product of time and work factors. The time factor is the percentage of total time the device actually uses air. The work factor, the percent of maximum possible work output per minute, is the ratio of air consumption under actual conditions of operation to air consumption when the tool is fully loaded.

#### **Plan for future growth**

Mechanically it is no problem to increase the size of a compressed air plant since any number of units can discharge into the same system. Some excess capacity, including piping, should be incorporated for future growth.

Most frequent indication that more compressor capacity may be needed is low air pressure. Low pressure reduces shop production sharply.

Based on a log of pressures throughout production areas, compressor operating load factors and peaks in demand (periods of unusually low air pressure), needed additional compressor capacity may be accurately determined.

In all calculations compressed air measurements should be in terms of cu ft per min of actual free air.

The number of compressor units into which total capacity should be divided is important. Compressed air supply during maintenance periods is provided for differently in almost every plant. If compressed air supply is vital to continued production, the method is usually determined by a comparison of the cost of standby capacity with the value of the production loss.

Many plants require a relatively small volume of air continuously, even when not in production. A small unit to take care for requirements over week-ends and holidays is often desirable and efficient. Examples of such requirements are dry pipe sprinkler systems, oil burners on furnaces which must be kept hot overnight or weekend; air supply for tools used by plant maintenance crews over week-ends, etc.

Location compressors with relation to point of use is important. A central location permits unified operation, better supervision, and probably less labor cost. In a central plant, it is probable that no more compressors will be kept operating than are necessary to maintain pressure. Load factor and operating efficiency of each unit will tend to be relatively high.

Sometimes an installation cannot be centrally located to give satisfactory distribution of air and maintenance of pressures without excessive piping costs. Two or more compressor installations at or near specific load centers may be the answer. These should be as close as possible to larger load centers and interconnected so air may be distributed either way to meet peak load requirements. This reduces piping costs and results in higher pressure at the tools with closer pressure control.

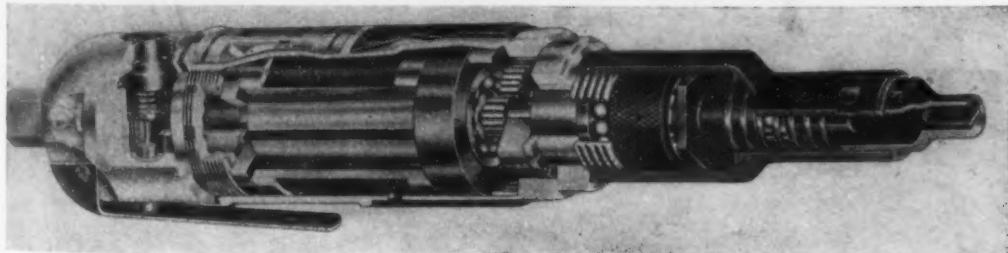
Since demand for air usually varies widely, some capacity control is required. Two methods are available. One varies the speed of the compressor according to the demand for air. The other operates the compressor at a constant speed and varies the capacity.

Control of pressure closer than a 5 pct range between full load and no load is generally unnecessary. Much closer pressure regulation can be provided where special conditions require.

Pressure regulators should be selected and adjusted so large units will carry the base load and unload only after smaller units have been shut down. Where requirements have diminished and a smaller unit can carry the load, the large unit should be shut down for economy.

In planning the distribution system some general rules should be observed:

## HOW AN AIR MOTOR OPERATES



AIR OPERATED tools are driven by the turning rotor of an air motor similar to that shown in the air screw driver above. A hardened steel rotor is encased eccentrically in the motor housing. Three or more fiber vanes are placed in slots cut laterally in the rotor. Expansion of compressed air introduced between the vanes through the inlet air port holes causes the motor to spin. As the vanes turn the rotor they eventually pass the outlet port in the housing through which the expanded air is exhausted. A governor controls maximum speed, while gearing or direct couplings create desired torque. The sliding feature of the rotor vanes allows air to bypass when the motor stalls. Except on screwdrivers for 5/16-in. and smaller sizes and impact tools, all air tools have a positive drive, stalling when the torque limit is reached. Since

the resultant torque must be absorbed by the operator, tools of straight drive have long handles. Screwdrivers for the smaller sizes contain an adjustable cushion clutch which kicks out when the screw has been driven to a predetermined torque. A clutch engaging mechanism permits the motor to run continuously but allows the bit to rotate only when the operator exerts a slight forward pressure after entering the bit in the recess of the screw head. Portable air tools such as this are light, cool in operation and flexible in meeting torque requirements. Screwdrivers similar to above, made by Keller Tool Co., Grand Haven, Mich., range in price from about \$65 to \$155, depending on size, power desired, rpm range (200 to 3500) and type of drive. Air drills, all straight drive, handle from 1/16 to 5/16 in. drills at 1200 to 12000 rpm. Price range is about \$70 to \$105.

Pipe sizes should be large enough so that pressure drop between receiver and point of use will not exceed 10 pct of initial pressure. Provision should be made for reasonable future growth.

Where possible, a loop system should be used around the plant and within each shop and building. This gives a two-way distribution to the point where air demand is greatest.

Long distribution lines should have liberal size receivers located near the far ends or at points of occasional heavy use. Many peak demands for compressed air are relatively short. Storage capacity near such points avoids excessive drop.

Frequent outlets should be provided on each header or main for attaching air hose. Outlets should be located at the top of the pipe line to prevent carryover of condensed moisture to the tool. Frequent outlets result in shorter hose length and less pressure drop through the hose.

Piping should slope toward a drop leg or moisture trap to remove condensed moisture

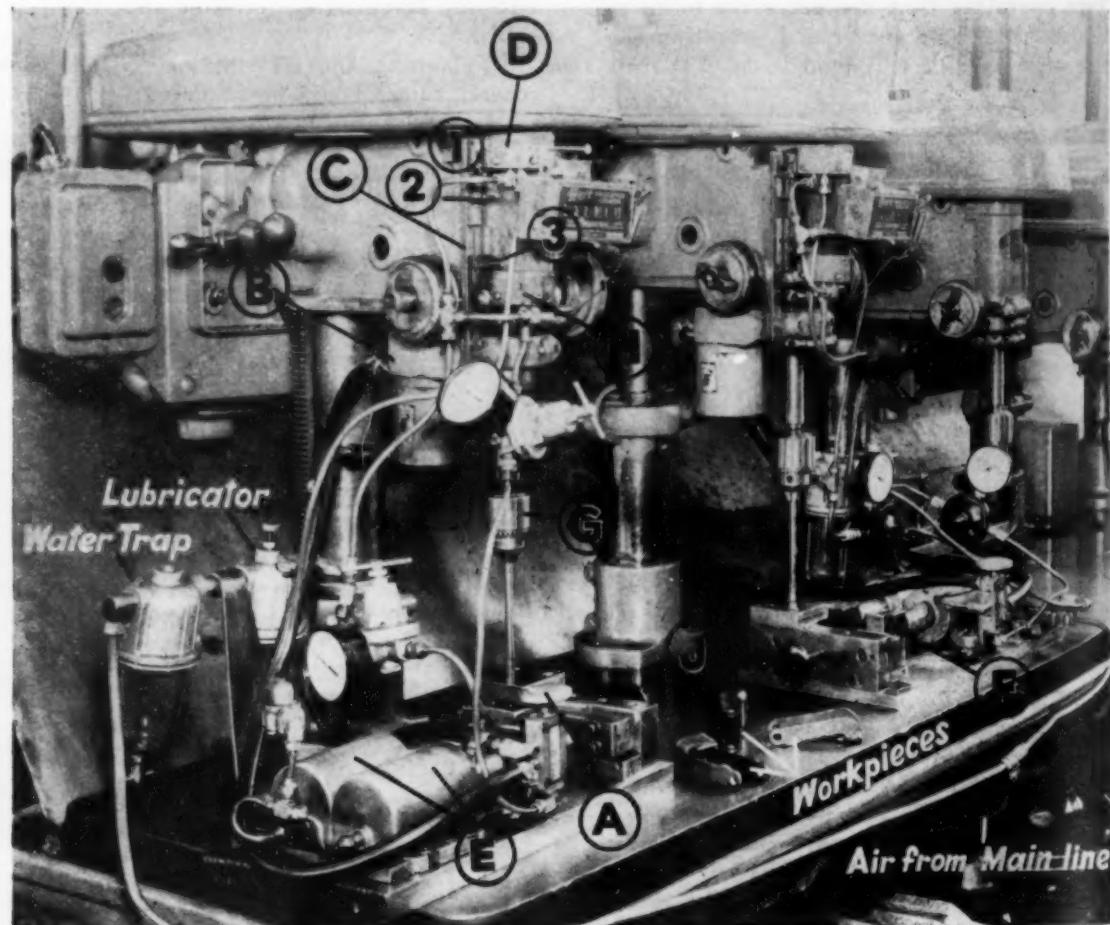
"Long distribution lines should have liberal size receivers located near points of heavy use . . ."

from the system and prevent it from being carried over into air tools.

In planning the distribution system, use of oversize piping costs little more than smaller size because most of the initial expense is for labor.

Selection of the compressor, reciprocating, rotary, or centrifugal, should be based on consultation with manufacturers' engineers. The type of power used, electric, steam, oil, gas or gasoline deserves careful study from the standpoint of first cost, operating cost, reliability of power, fuel supply and maintenance.

Low or inadequate pressure at the tool, where air is used as power is costly and wasteful. Only the pressure and volume of air avail-



OUTPUT WENT UP 100 pct with installation of this air powered drilling rig operated by one man, devised by Barth Stamping Co., Cleveland. Principal parts are: A, air valve for starting; B, spindle cylinder; C, travel control rack; D, clamp valve; E, clamp cylinders; F, clamp head; G, spindle; H, cycle reversing valve; J, ejector rods. Travel control cams are numbered 1, 2, 3 and 4.

**"Leakage eliminated is pure gain.  
... Losses often reach 10 to 20  
pct of total air compressed..."**

able at the point of use can be effective in doing work. Most pneumatic tools are designed to operate at 90 lb gage, maximum at the tool.

Pressure below the 85 to 90 lb gage reduces the ability of the tool to do the maximum work for which it was designed. It has been customary to add an arbitrary 10 pct for leakage. In the fuel gas distribution, an acceptable limit is less than 1 cfm per mile of 3-in. line.

Air lines can be made and kept as tight as other piping system, with subsequent cost savings.

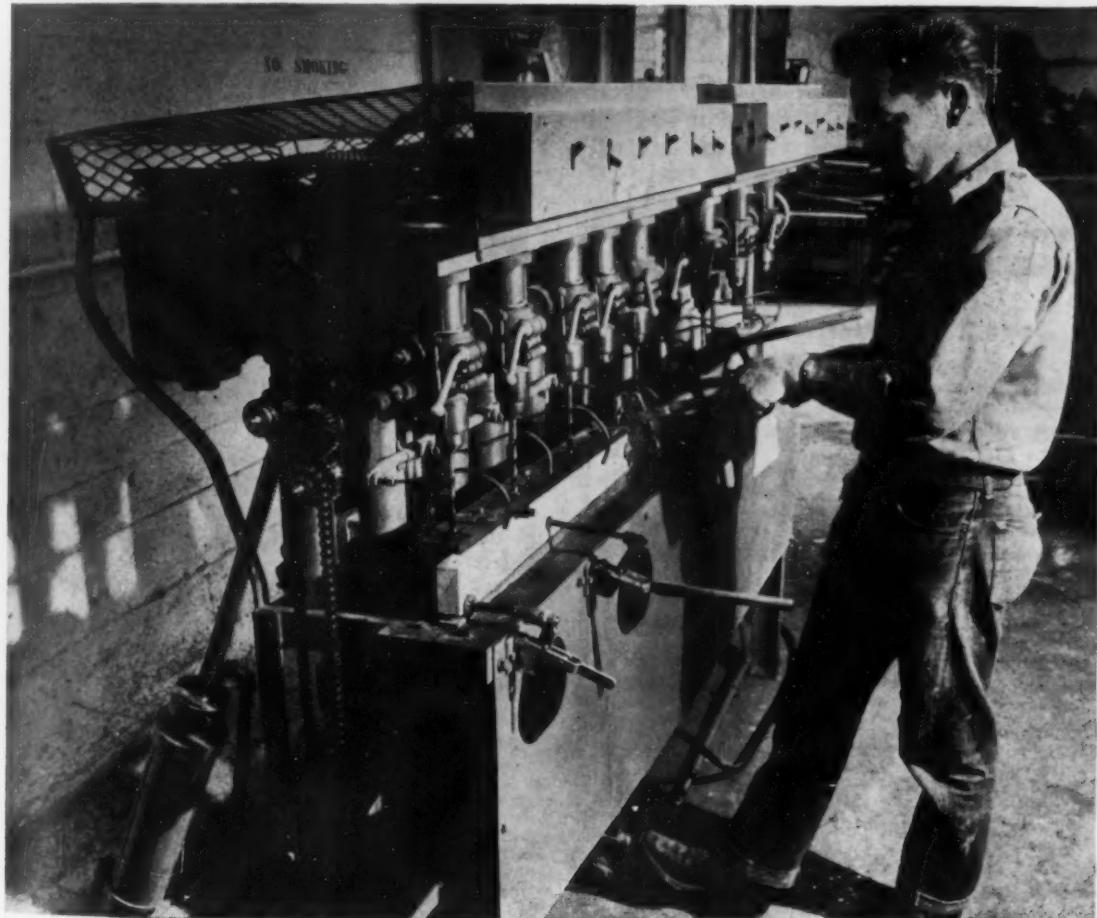
Insufficient compressor capacity, inadequate piping, and leakage are chief causes of low air pressure. When pressure is too low it should be determined whether compressors are at full

load when air pressure is low. If they are, more compressor capacity may be needed. Both piping and leakage in the system should be carefully checked however, before installing additional compressor capacity.

A measure of piping efficiency is pressure loss between air receiver, where the compressor endeavors to maintain constant pressure, and the point of use. Pressure drop should not exceed 10 pct. Maximum drop for the worst point in the system should not exceed 15 pct. If the pressure drop exceeds these figures throughout the system, including hose, this fault should be corrected before considering increased compressor capacity.

Every cubic foot of leakage eliminated is pure gain. Such losses often reach 10 to 20 pct of total air compressed. An air leakage test should be run on the complete plant and every section of hose inspected. Although leaks are usually small, they may be numerous and have a high total effect. A single 1/16-in. hole will waste 182,000 cu ft per month.

Small leaks are usually found around valve



MULTIPLE DRILLING is easily handled by one man using this shop-made unit. Set up at Food Machinery Corp., Riverside, Calif., unit uses air feed drills. Hardwood handle is placed in drilling fixture. At touch of foot pedal air cylinder is actuated, turning chain drive at each drill. Speed of feed is governed by changing air volume or pressure. Unit operates 14 drills at one time—nine at top of handle, four underneath, one at the back.

**"Adding to compressor capacity  
affords protection for many vital  
shop operations . . ."**

stems, in hose connections, unions, drains, homemade blow guns, and lines leading to inoperative tools. Elimination of leakage involves making the system tight, then keeping it tight. Regular inspection is mandatory.

All portable pneumatic tools operate more effectively at proper air pressure. An average increase of 37 pct in production can be obtained for about 30 pct increase in air consumption by increasing pressure at the tools from 70 to 90 lb.

Air analysis of 20 tools operating from an \$8500 compressor plant, first at 70 lb gage and then at 90 lb gage is shown in the Table.

Adding to compressor capacity frequently affords protection for many vital shop operations such as sandblasting, paint spraying, hoisting, agitation of liquids, air jet vacuum equipment for cleaning foundry sand, operating controls in power plants, air chucks in a machine shop, safety devices on punch presses, air jets for ejecting parts from presses, etc.

Pressure loss varies roughly as the square of the velocity of air flowing through the pipe. A 3-in. line, 1000 ft long, will handle 500 cfm with a 2.5-lb pressure loss. A 4-in. line will pass about 1000 cfm with the same drop.

**ARE YOU GETTING THE MOST FROM  
YOUR AIR SYSTEM?**

**Some Representative Air Tools**

**Assembly**

Impact wrenches, angle wrenches, drills, screw-drivers, riveters, stapling machines, assembly jigs, air presses for press fit assembling, nut runners, hoists.

**Foundry**

Tamers, chippers, grinders, core breakers, hammers, hoists, core-blowers, mold handling machines, sandblasting, air jet sand cleaning equipment.

**Inspection**

Inspection fixtures, jigs, multiple gaging devices.

**Machining**

Grinders, wire brushes, impact wrenches, nut runners, angle wrenches, drills, hoists, chucks, turret lathes, drill presses, chip blowout air taps.

**Maintenance and Construction**

Drills, pavement breakers, jack hammers, diggers, tamers, chippers, riveters, winches, sump pumps.

**Materials Handling**

Hoists, transfer mechanisms, platform lifts.

**Painting**

Spray guns, agitators, belt conveyors.

**Pressing and Forging**

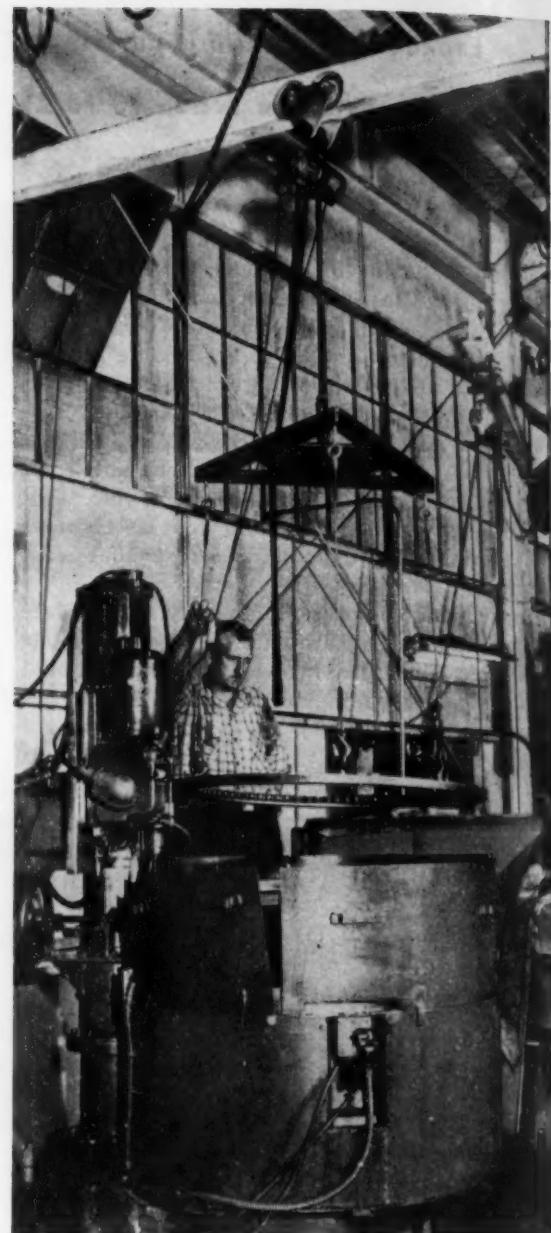
Air powered devices for moving stampings in, thru and out of presses, ejection units, safety devices, kick presses, arbor presses.

**Sheetmetal Work**

Grinders, buffers, wet sanders, dry sanders, hoists, spray guns, air hammers, shears.

**Welding**

Multiple spot welders, portable gun welders, welder cooling system controls.



AIR HOIST takes air feed drills to the work at Solar Aircraft, San Diego, Calif. Formerly work was carried to single-spindle automatic drilling machine. Handling time was saved and drilling done in  $\frac{1}{4}$  of previous time.

Methods of increasing line capacity to decrease pressure loss and improve conditions at point of use vary. One may call for a line paralleling the original, with frequent interconnections. Another may require installation of a loop system with some outlets taken off the new line to relieve the old. Still another may need a complete new system.

Branch lines and manifolds for attachment of tools, etc., should be planned "oversize."

Selection of proper air hose is important. Losses of 15 to 25 pct in air pressure are frequent in the hose alone. Don't use a hose longer than is necessary to make the tools available to the work and to give proper freedom of movement to the operator.

# "no more GAMBLING on tool steel selection"



[1/3 actual size; Selector is in 3 colors]

#### Here's how it works:

To use the Selector, all you need know is the characteristics that come with the job: type and condition of material to be worked, the number of pieces to be produced, the method of working, and the condition of the equipment to be used.

#### FOUR STEPS—and you've got the right answer!

1. Move arrow to major class covering application
2. Select sub-group which best fits application
3. Note major tool characteristics (under arrow) and other characteristics in cut-outs for each grade in sub-group
4. Select tool steel indicated

That's all there is to it!

#### Here's an example:

**Application** — Deep drawing die for steel

**Major Class** — Metal Forming—Cold

**Sub-Group** — Special Purpose

**Tool Characteristics** — Wear Resistance

**Tool Steel** — Airdi 150

One turn of the dial does it!

And you're sure you're right!

That's what one of the thousands of pleased users says about his CRUCIBLE TOOL STEEL SELECTOR, the new, simple, handy method of picking the right steel, *right* from the start. Since Crucible announced this Selector two years ago, thousands of tool steel users have received their Selectors . . . and here's what some of them say —

*"Handiest selector I've ever seen!"*

*"Saves me time and headaches"*

*"It's so logical—you begin with the application".*

You can be sure the answer you get with your Crucible Tool Steel Selector will be just right in every case, for this Selector covers 22 tool steels which fit 98% of all tool steel applications. And when—with a flip of the round dial—you get the answer, you'll get the steel FAST, too, because all the tool steels on the Selector are right in stock, in all our 26 conveniently-located warehouses.

This Selector is bound to be a big help to you—so write for yours today. There is no obligation whatsoever. Just fill in the coupon and mail now . . . before you turn this page and forget! CRUCIBLE STEEL COMPANY OF AMERICA, Chrysler Building, New York 17, New York.

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| New York 17, N. Y.                                 |
| Gentlemen:   |
| Sure! I want my free CRUCIBLE TOOL STEEL SELECTOR! |
| Name _____ Title _____                             |
| Company _____                                      |
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first name in special purpose steels

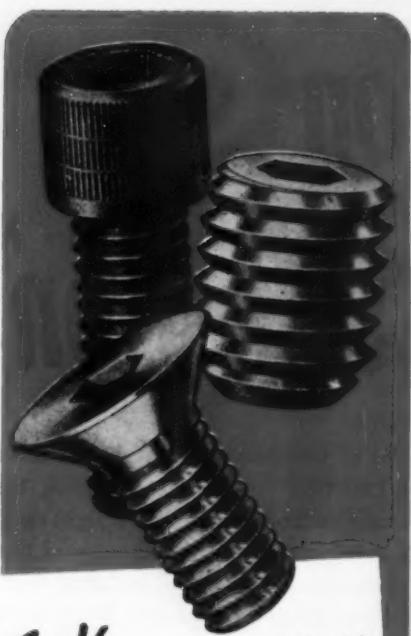
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ROCKFORD • SAN FRANCISCO • SEATTLE • SPRINGFIELD, MASS. • ST. LOUIS • SYRACUSE • TORONTO, ONT. • WASHINGTON, D. C.

# Technical Briefs

Engineering



Wherever you  
use fasteners

- ✓ ..... under vibration
- ✓ ..... under strain
- ✓ ..... in limited space
- ✓ ..... for fine adjustment
- ✓ ..... in inaccessible places
- ✓ ..... needing strength in small sizes
- ✓ ..... in compact design
- ✓ ..... for maximum holding power
- ✓ ..... for fastening thin pieces

... use genuine  
**ALLEN HEAD**  
socket screws and keys

Class 3 fit, quality controlled  
uniformity and strength, wide  
range of standard sizes.



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MANUFACTURING COMPANY  
Hartford 2, Connecticut, U. S. A.

## SAFETY:

GE uses "pistol" to demonstrate effectiveness of safety lenses.

A "pistol" which shoots steel bullets is helping protect the eyesight of employees of the General Electric Co., Schenectady, N. Y.

The gun is part of a unique "eyesaver" unit used to point out the effectiveness of safety glasses.

**Steel Ball**—Mounted at one end of the "eyesaver" unit, which is about the size and shape of an ordinary shoe box, the gun fires a steel ball at a pair of eyeglass lenses at the other end of the box.

The person demonstrating the device shoots the gun at each of the lenses. The steel ball easily shatters the lens of the ordinary glass, but bounces harmlessly off the safety glass.

Its greatest value is the dramatic manner in which it shows the sharp splinters and glass dust which cause the most serious injuries when an ordinary lens is broken.



PISTOL shoots steel ball in effective demonstration of extra eye protection afforded by safety glasses.



STEEL BALL,  $\frac{3}{8}$  in. in diam, bounces back from safety glass lens, right, but shatters ordinary lens, left. Danger to eyes is less from large pieces of flying glass than from small particles which hit eyeball at speeds as high as 15 mph.

## IF YOU WANT MORE DATA

You may secure additional information on any item briefed in this section by using the reply card on page 69. Just indicate the subject heading and the page on which it appears. Be sure to note exactly the information wanted.

## CORROSION:

Accurate measurement of corrosion rates made by NBS.

A recent laboratory study by the National Bureau of Standards proves for the first time that the rate of weight loss of a piece of steel corroding normally in soil can be measured electrically, without actually weighing the metal.

Conducted by the NBS corrosion laboratory, the study gives further evidence that the electrochemical theory of corrosion applies generally to soils.

**Practical Value** — Although measurements were restricted to the laboratory, success of the work suggests the possibility of valuable practical applications, such as determination of the corrosion rate of a tank or other underground structure without the need for visual inspection.

When iron or steel is exposed to the soil, local differences in electrical potential develop at the surface of the metal, resulting in the formation of numerous small corrosion cells.

**Current Flows** — This means that electric currents flow through the soil from certain areas (anodes) to areas of less negative potential (cathodes), with accompanying discharge of hydrogen ions at the cathodes and loss of metal from the anodes. By Faraday's law, the rate of weight loss from corrosion is proportional to the current.

The NBS-demonstrated technique is based on a relation showing that the current in a corrosion cell can be expressed in terms of the values of positively and negatively applied direct current.

**More Accurate**—The electrical method makes possible much more accurate comparisons of the corrodibilities of such materials. Field determination of underground corrosion by the electrical method, if practical, would obviate the need for excavating the underground object.

The electrical method also measures the present corrosion rate, which is likely to be of greater practical interest than the history of past corrosion. The electrical method does not involve the removal of corrosion products, which often inhibit corrosion.

#### MACHINING:

##### Carbides speed production of 50-year old planer.

Production-time decreases to 82.5 pct are being achieved on planing both steel and cast iron by use of clamp-on-tip planer tools for steel and cemented tungsten-carbide inserts for cast iron.

An outstanding example in planing of steel liner plates uses Kennametal's grade K-1 in place of high speed tools. Offsets 9/16-in. deep by 1 1/8-in. wide are planed on the sides of six, 32-in. long workpieces lined up end-to-end on the planer table.

**Old Timer**—A 50-year-old planer with a top speed of 40 sfpm with hand feed is used. Material is of 260-270 Bhn. Feed is approximately 3 3/32-in. with 9/16-in. depth of cut.

Previously, the operation required 40 min to plane the offset on one side of six liner plates. This same operation is now performed in 7 min.

**New Life**—Since the old planer was not equipped with tool lifters, *Turn Page*

January 15, 1953

**AHEAD OF THE VAPOR TRAIL...**



THAT streak in the sky is a Curtiss-Wright Sapphire J-65 Turbo Jet Engine powering a high-altitude plane. The intense heat—approximately 1500° F.—developed during flight is enough to disintegrate "normal" materials, formed in the usual way. Yet in this inferno of power Lebanon Stainless Steel Centrifugal\* Castings of special heat-resistant alloys are giving dependable service as ...

TURBINE SHROUDS  
HEAT SHIELD SUPPORTS  
EXHAUST CONE FLANGES  
COMBUSTION CHAMBER FLANGES  
TURBINE BLADE SPACER RINGS

"CENTRI-DIE", patented name for method of casting steel centrifugally in metal molds, under license agreement with Firth-Vickers Stainless Steels Limited, Sheffield, England. Lebanon also makes steel castings, both static and centrifugal, in refractory molds.

Have you seen...  
STEEL WITH A  
THOUSAND QUALITIES?

This 37-min., 16 mm., full-color sound film showing steel castings from blueprint to end use should be shown to your organization. For information, write: Dept. A, Lebanon Steel Foundry, Lebanon, Pa.

**LEBANON Castings**  
CARBON, SPECIAL ALLOY  
AND STAINLESS STEEL

LEBANON STEEL FOUNDRY

LEBANON, PA.



## Better Look Into This!

It was designed to fit your needs when building a new plant, or when modernizing or expanding your present one. Commercial Contracting Corporation developed the INDUSTRIAL PACKAGE PLAN integrating construction and machinery installation services under one contract and eliminating duplication of effort by assuming the entire responsibility as one contractor. Yes, better look into this plan for earlier production and lower costs.

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## COMMERCIAL CONTRACTING

*Corporation*

GENERAL CONTRACTORS



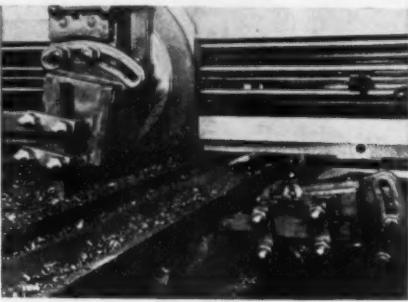
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TEXAS  
4-7400

### —Technical Briefs—

14-in. hinges were clamped under the cemented tungsten-carbide tools to keep them from dragging on the return stroke. Results demonstrate that tungsten carbide tools properly applied will increase production even on old machines.

Present-day machine tools having greater rigidity, speed, and power permit more rapid and efficient metal removal with carbide tools. This was demonstrated by



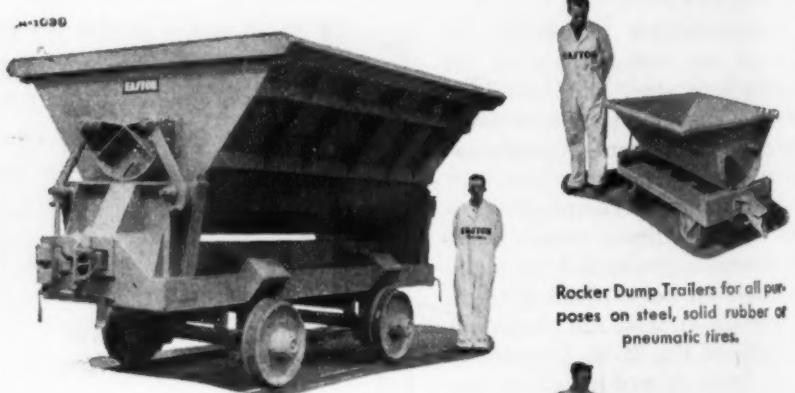
PLANING TIME on cast iron was cut 50 pct on this 50-year-old planer through use of tungsten carbide inserts. Faster feeds possible were big factor in reducing machining time.

performing the above operation in about 2.3 min on a new Cincinnati Hypro with Kennametal tools operating at the same feed and depth of cut as before but with an increase to 120 sfpm.

**Castings**—In another interesting instance, a machine tool builder, who previously had used high-speed steel tools for planing the top and side of 15-ft gray iron castings, now uses two heavy-duty Kendex cemented tungsten carbide inserts 1½-in. diam by ¾-in. thick.

Top surface of these pieces is 21 in. wide and the side, only 10 in. wide, presents severe interrupted cutting because of a series of openings along the entire length.

The 1½-in. carbide inserts permit planing cuts to 5/8 in. deep. A continuous 6° clearance which permits feeding to the right or left without tool changing, thus reduces down time resulting from the usual tool adjustments.



Rocker Dump Trailers for all purposes on steel, solid rubber or pneumatic tires.

Rocker Dump Cars, gravity dump to either side. Capacities 18 cu. ft. to 8 cu. yds.

# EASTON

## ROCKER DUMP Cars and Trailers

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA. • NEW YORK • PHILADELPHIA • PITTSBURGH

THE IRON AGE

Over 85% of the torque wrenches used in industry are

# Sturtevant

## TORQUE WRENCHES

*Read by Sight, Sound or Feel.*

- Permanently Accurate
- Practically Indestructible
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- All Capacities

in inch ounces...inch pounds...footpounds  
(All Sizes from 0-8000 ft. lbs.)

Every manufacturer, design and production man should have this valuable data. Sent upon request.

PA/Sturtevant CO.  
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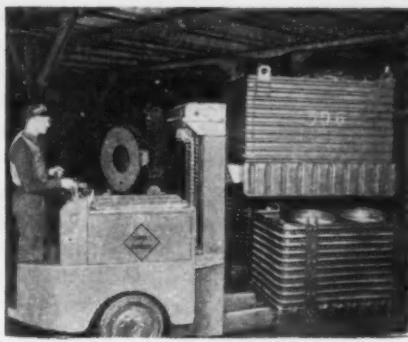
### Technical Briefs

#### MATERIALS HANDLING:

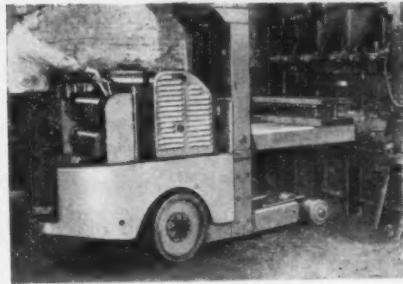
Plenty of aisle room important when trucks are used.

Fork trucks used for materials handling operations in metalworking plants can usually "turn on a dime." Nevertheless, plenty of aisle space is an important factor in efficient, safe use of trucks.

How much aisle space depends on truck size. Regardless of size, however, too little aisle and turning space cuts maneuverability and slows operation. Opportunity for damage to materials both on and off the truck is increased where insufficient is available.



OVERHEAD clearance is important. Smoother operation and better use of storage areas are possible.



IDLE PRESS TIME is held to a minimum when operator has easy access to press when delivering heavy dies.



PLENTY OF ROOM is available for maneuvering truck near this big press. Driver has delivered steel sheet blanks and is backing away. Trucks by Elwell-Parker.

**Are you selling  
used machinery,  
tools, equipment  
or surplus  
materials?**

Let an advertisement in **The Iron Age** help speed up the process by contacting the many buyers who look here for leads.

### QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

**THE WHELAND COMPANY**

CHATTANOOGA 2, TENN.

### METAL STAMPING FACILITIES

by *Lansing*

at your Service for...

**TRANSPORTATION EQUIPMENT**

**HOUSEHOLD APPLIANCES**

**ELECTRICAL EQUIPMENT**

**INDUSTRIAL EQUIPMENT**

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IMPLEMENTS

**Lansing Stamping Co.**

ESTABLISHED 1914

LANSING 2 MICHIGAN



*Everybody gets into the act . . .*

**T**hat's the way we want it to be, here at Claymont.

Because that's the way we make sure that your order for alloy steel gets careful, individualized supervision . . . painstaking attention to every processing detail right from the front office, through our laboratories, down to the men who roll your steel.

Let us show you how our *personal touch* assures you of alloy steels that are truly tailored to your specialized requirements.

Write or call Claymont Steel Products Department, Wickwire Spencer Steel Division, Claymont, Delaware.

THE COLORADO FUEL AND IRON CORPORATION • Denver, Colorado

THE CALIFORNIA WIRE CLOTH CORPORATION • Oakland, California

WICKWIRE SPENCER STEEL DIVISION • Atlanta • Boston • Buffalo • Chicago • Detroit • New York • Philadelphia

## CLAYMONT STEEL PRODUCTS

PRODUCTS OF WICKWIRE SPENCER STEEL DIVISION  
THE COLORADO FUEL AND IRON CORPORATION



## Consumer Durable Market Rushing to Showdown

**Mounting steel output, lifting of controls will give market for consumer durables first real test in 3 years . . . Two of major automakers book conversion steel into second quarter.**

The market for consumer durable goods is approaching its first test in nearly 3 years.

Lifting of controls and ever-increasing steel production are expected to pave the way for a showdown. Manufacturers who have been clamoring almost without setup for more steel will likely get chance to find out how much they can use.

This will put the test up to their sales forces. To the degree that their sales people are successful, they will be in the market for steel in the second half of the year. Most observers consider it a foregone conclusion that high production rates and a tight market will extend at least through the first half of the year.

**Detroit Conversion**—Fresh evidence of strong steel demand has been turned up this week. THE IRON AGE has learned that at least two of the biggest auto producers have booked conversion steel through the second quarter. The third member of the Big Three is expected to follow suit. After the steel strike, it will be recalled, conversion demand was expected to fall by the end of 1952. Some auto makers now believe that steel will remain tight through the third quarter—and perhaps through the entire year.

This is an important indication of steel market strength. The auto industry has long been the backbone of the conversion market, and the steel industry's biggest customer. Operating under strict government controls, last year it received over 17 pct of finished steel shipments; in 1950 it received 21.8 pct, for more than any consuming industry.

**Harry Suppliers**—The big production push of auto and appliance industries is being reflected in emergency production demands on their suppliers. Stampers, particularly, report business rivaling their boom of 1950. Many of their orders are short run jobs labeled "emergency, rush."

Many manufacturers apparently are paying little or no attention to restrictive government quotas on steel use. This is evidenced by production targets much higher than can be realized from scheduled allotments. And it's interpreted to mean that: (1) They have already discounted steel controls, or (2) they are confident they can fulfill material needs even under government restrictions.

Steel consumers do not appear greatly impressed by statistics on greatly expanded steel capacity and ever increasing production. They are more interested in learning how long it will be before they can place orders for the sizes and shapes they want with reasonable delivery promises.

**Free Market Best**—Most steel consumers seem to feel they will fare better in a free market than they have under government controls. Last week a steel fabricating group in the Midwest passed resolutions supporting the steel industry recommendations for decontrol. A week earlier the Senate Small Business Committee had arrived at the same conclusion. Planners can not help being sensitive to such evidence because it comes from those they have sworn to protect.

The tight steel market has been a lifesaver for small and non-integrated producers. Before the

steel strike last summer most of these firms showed gaping holes in their order books. Some of them were unable to keep all their facilities operating, even though they were taking on business outside their regular lines.

Post-strike shortages have enabled them to build healthy order books. With the exception of some wire and specialty items their order books are now loaded. When steel supply and demand start swinging into balance they will be among the first to feel it.

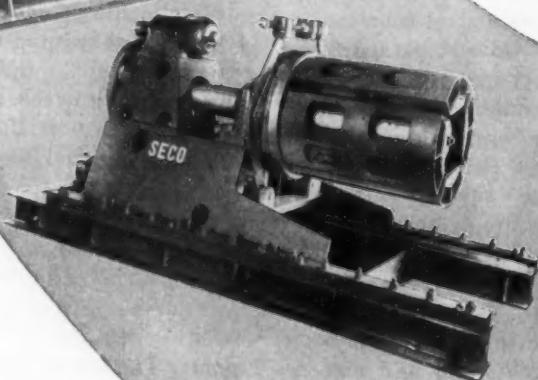
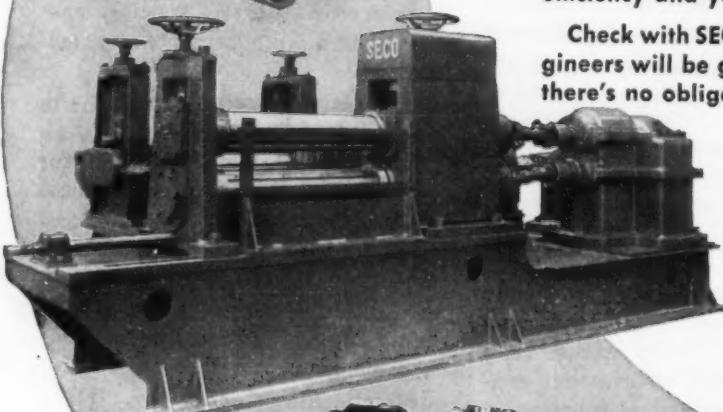
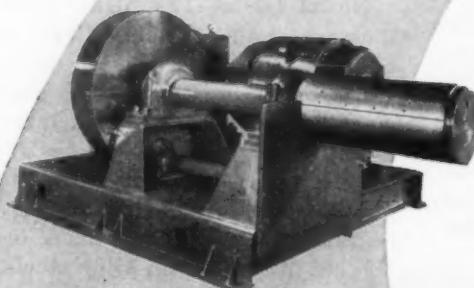
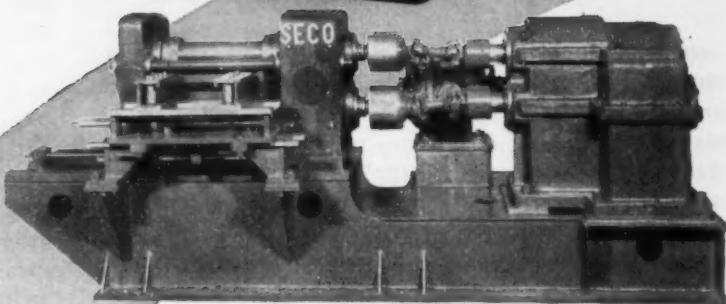
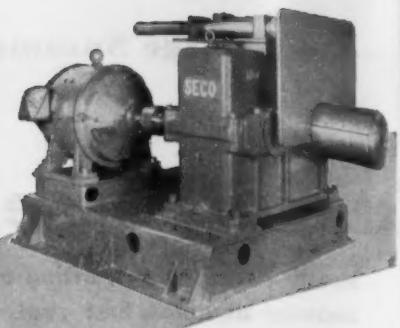
**Nickel Costs**—The nickel price increase of 3½¢ per lb is likely to be passed through to the consumer. Office of Price Stabilization says nickel users may apply for relief directly to its Industrial Materials and Manufacturer Goods Div. The impact of the nickel increase may be felt on a variety of items including stainless and alloy steels, nonferrous alloys, special cast irons, and high temperature materials.

If passed along, the 3½¢ per lb increase on nickel might mean an increase of close to \$6 a ton for type 18-8 stainless steels. Nickel bearing stainless steels are among the tightest items in the market. Straight chrome stainless is in better supply, and is being substituted for nickel stainless in some applications.

Steelmaking operations this week are scheduled at 98.5 pct of rated capacity, unchanged from the previous week. This rate is based on the new 1953 capacity of 117.5 million net tons per year.

A strike of openhearth crane operators at Kaiser's Fontana (Calif.) plant over incentive pay started on Monday and prevented an increase in the rate which had been scheduled to advance one point. The strike was still in progress at press time.

# YOU CAN SLIT 1/4" STEEL LIKE PAPER!



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## STEEL EQUIPMENT CO.

Designers and Builders of Steel Mill Equipment  
P. O. BOX 737, WARRENSVILLE STATION  
CLEVELAND 22, OHIO

• Shown above are two heavy-duty SECO Slitting Lines capable of slitting steel up to 1/4" thick. The payoff reel, slitter and recoiler in the top three photos handle up to 20" width stock. The bottom three photos show a line of simplified design for slitting strip up to 42" wide. Both lines will handle up to 20,000 pound coils.

# SECO

## Market Briefs and Bulletins

**More Coal Needed**—Increasing defense demands will make it necessary for 10 million more tons of coal to be mined during 1953 than came from the ground last year, it is forecast by the Defense Solid Fuels Administration. This means that 475 million tons must be mined this year to prevent industrial users digging into their yard stocks. It is estimated that power plants, steel mills, coke ovens and other large industrial users now have in their hands more than 75 million tons and that these stocks could slip about 35 million tons without danger.

**Australian Uranium**—Much of the ore from the rich uranium deposits of Australia's "Rum Jungle" area is expected to come to this country under terms of a new exploration and development agreement signed by the U. S., United Kingdom, and Australia. The 10-year arrangement provides that Australia will have the option of keeping a portion of the ore for either defense or civil power uses. That country has pledged cooperation with the U. S. and U. K. in assuring supplies, money, and equipment for mining and, eventually, refining the ore.

**Coated Products Up**—Reflecting increased zinc prices, U.S. Steel Export Co. has revised export base prices with freight included to New York, Philadelphia and Baltimore. The increase was effective with shipments from producing mills Jan. 3. Products covered under the revision are: Galvanized pipe and tube, and galvanized wire.

**Steel Kitchens**—Republic Steel Corp. will market its own line of steel kitchens early this spring. The kitchens will be fabricated by Republic's Berger Mfg. Div., Canton, Ohio, where more than \$1 million has been spent for retooling.

**Wildcat Strike**—An unauthorized strike of openhearth crane operators last Monday over incentive pay almost totally shut down Kaiser Steel Co.'s Fontana, Calif., plant. At the beginning of the week blast furnaces were being banked. Striking union was the CIO United Steelworkers Local 2869. Total employment there was about 6500.

**Rebuilt Ovens**—American Steel & Wire Co. recently completed a 6 month rebuilding program when 45 coke ovens began pushing out 500 tons of coke daily. The ovens had been in continuous operation for 15 years before the relining process was started. Program, which included installation of a new collecting main, cost an estimated \$1.3 million.

**Taconite Plant**—Reserve Mining Co., jointly owned by Republic Steel Corp. and Armco Steel Corp., recently sold a \$148 million issue of 4½ pet bonds to finance construction of a modern plant for processing taconite at Babbitt and Beaver Bay, Minn. Officials hope to complete plant by June, 1957. Initial plant capacity will be about 3,750,000 tons when completed in June, 1957. Planners hope to increase annual output gradually until it reaches 10 million tons.

**Hike Sulfuric Output**—Defense Production Administration has announced that estimated annual capacity for production of virgin sulfuric acid should be increased to 17.5 million tons not later than Jan. 1, 1955. This represents a boost of 4.1 million short tons over the Jan. 1, 1951 estimated capacity. It does not include capacity for recovery and treatment of spent acid. DPA also revised downward an earlier goal of 8.4 million long tons for sulfur production capacity by 1955.

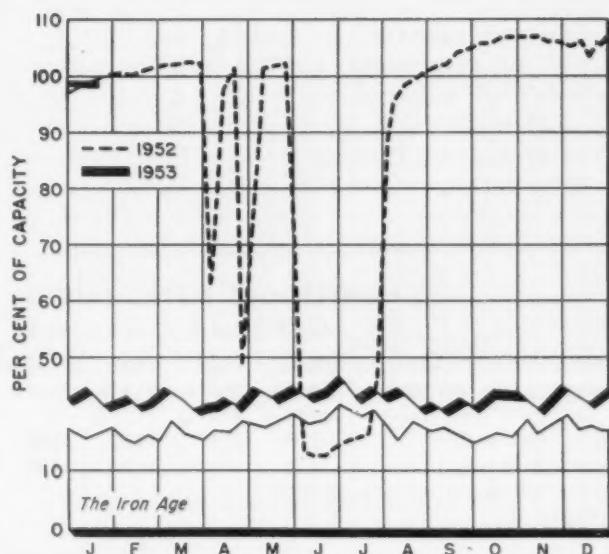
## STEEL OPERATIONS



### District Operating Rates

| District              | Week of Jan. 11 | Week of Jan. 4 |
|-----------------------|-----------------|----------------|
| Pittsburgh            | 105.0           | 99.5           |
| Chicago               | 105.5           | 99.0           |
| Valley                | 104.0           | 97.5           |
| Philadelphia          | 97.0            | 95.5           |
| West                  | 93.0            | 99.5           |
| Buffalo               | 100.0           | 100.0          |
| Cleveland             | 99.5            | 98.5           |
| Detroit               | 104.0           | 99.0           |
| Wheeling              | 101.0           | 98.0           |
| Birmingham<br>(South) | 95.5            | 100.0          |
| South Ohio River      | 93.5            | 93.0           |
| St. Louis             | 93.0            | 93.0           |
| East                  | 95.0            | 93.0           |
| Aggregate             | 98.5            | 98.5           |

Beginning Jan. 1, 1953, operations are based on annual capacity of 117,547,470 net tons.  
\* Revised



## Nonferrous Markets

### OPS "Approves" Nickel Price Hike

Inco boosts nickel 3½¢ per lb . . . OPS "approves" a like increase for distributors—whether the agency likes it or not . . . Most zinc on average price basis—By R. L. Hatschek.

The price of nickel was advanced 3½¢ per lb effective Jan. 14 by International Nickel Co. of Canada. The f.o.b. Port Colborne price is now 60¢ per lb including the U. S. import duty. Cheapness of the U. S. dollar north of the border was given as the reason for the boost.

Office of Price Stabilization then "approved" the increase for domestic distributors of nickel—they had to whether they liked it or not. This will give the distributors their normal pre-Korea markup. OPS has taken no action to permit consumers of nickel to pass along the higher prices in their products. Manufacturers may, however, apply for relief directly. Such applications will go through the Industrial Materials and Manufactured Goods Div. of the agency.

**Tin Rations**—National Production Authority last week was looking around for additional quantities of pig tin for allotment to tinplate producers. Unless the first quarter allocation of 8070 tons is increased substantially, industry representatives have warned the government, tinplate producers will not be able to meet first quarter orders.

The agency said it would try to get extra pig tin in time to relieve

the first quarter shortage. This shortage has worked to stiffen NPA's opposition to revoking the tinplate order, M-24, in the near future. Controls have already gone overboard on secondary tin mill products.

**Tin Markets**—Meanwhile, the trend in world tin markets reversed itself late last week. Prices in London and Singapore had started slipping after Christmas but bounced back up last Friday. Trading in New York has been generally sluggish but the price seems firmly affixed to the practical top of \$1.21½ per lb, the same as Reconstruction Finance Corp.'s resale figure.

Higher demand from the U. S. was given as the reason for the increase in Far Eastern tin prices and, of course, this was reflected in London. But the present British level makes it unprofitable to deal with U. S. consumers.

**Zinc Output**—Slab zinc smelters racked up a near record for themselves in 1952. Total production for the year added up to 961,200 tons, just shy of the alltime record set in 1943 of 971,873 tons. At the clip they are now hitting, the difference comes to just 4 days of production. Shipments for December dropped off some 13,500 tons

from the very high November total to 77,295 tons.

The month's production of 81,133 tons was the biggest since before the steel strike and, as a result, stocks at the end of the year showed a gain over the previous month, totaling 86,987 tons. While high, these stocks show a decline from the first 4 months following the strike.

**Average Basis**—The London market has now firmly taken U. S. zinc prices in tow. Prices prevailing on the other side are roughly equivalent to 13¢ per lb at New York. But the New York quotation has been at 13.83¢ since the first of the month. Result is a definite lack of confidence in the present domestic price setup.

Evidence of this is found in most purchases being made—they're on an average price basis. As long as London and domestic prices maintain this sort of relationship, there will be no confidence in the U. S. quotations.

**Aluminum Production**—November total of aluminum production was 74,639 tons, compared to 77,312 tons in October. No, it isn't another power cut, just a 30-day month. But there is still a good possibility that further power cuts may be in the offing on the Pacific Coast.

Sheet and plate shipments for the month, as reported by the Aluminum Assn., totaled 48,353 tons as against 52,981 for October. Foil producers shipped 6,677,685 lb (8,106,545 lb in October) and rough castings shipments, except pistons, were 3,505,969 lb (3,463,656 lb in October).

**Tariff Action**—Rep. Daniel A. Reed, R., N. Y., chairman of the House Ways and Means Committee, says he'll give the inside track to legislation to extend the suspension of the copper import tariff to June 30, 1954. Early House approval is assured.

#### NONFERROUS METAL PRICES

|                              | Jan. 7  | Jan. 8  | Jan. 9  | Jan. 10 | Jan. 12 | Jan. 13  |
|------------------------------|---------|---------|---------|---------|---------|----------|
| Copper, electro, Conn. . .   | 24.50   | 24.50   | 24.50   | 24.50   | 24.50   | 24.50    |
| Copper, Lake delivered . . . | 24.625  | 24.625  | 24.625  | 24.625  | 24.625  | 24.625   |
| Tin, Straits, New York . . . | \$1.21½ | \$1.21½ | \$1.21½ | .....   | \$1.21½ | \$1.21½* |
| Zinc, East St. Louis . . .   | 13.00   | 13.00   | 13.00   | 13.00   | 13.00   | 13.00    |
| Lead, St. Louis . . .        | 14.30   | 14.30   | 14.30   | 14.30   | 13.80   | 13.80    |

Note: Quotations are going prices.

\*Tentative.